

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 67

Faster production

.... better products

With America and all the world waiting for goods, what can industry do to get faster production?

One practical answer is this—faster machine speeds—more pieces per hour, at lower cost.

That can be done—best—if machines are equipped with New Departure ball bearings.

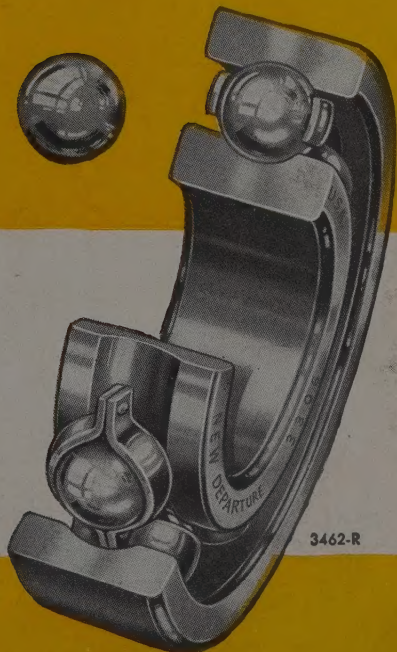
They operate with less friction, less wear, than any other type of bearing. They permit higher speeds, faster production. They hold machine parts precisely in place, under every kind of load. They assure unchanging accuracy, and uniformly better products. Write for booklet, "Why Anti-Friction Bearings."

Nothing rolls like a ball....

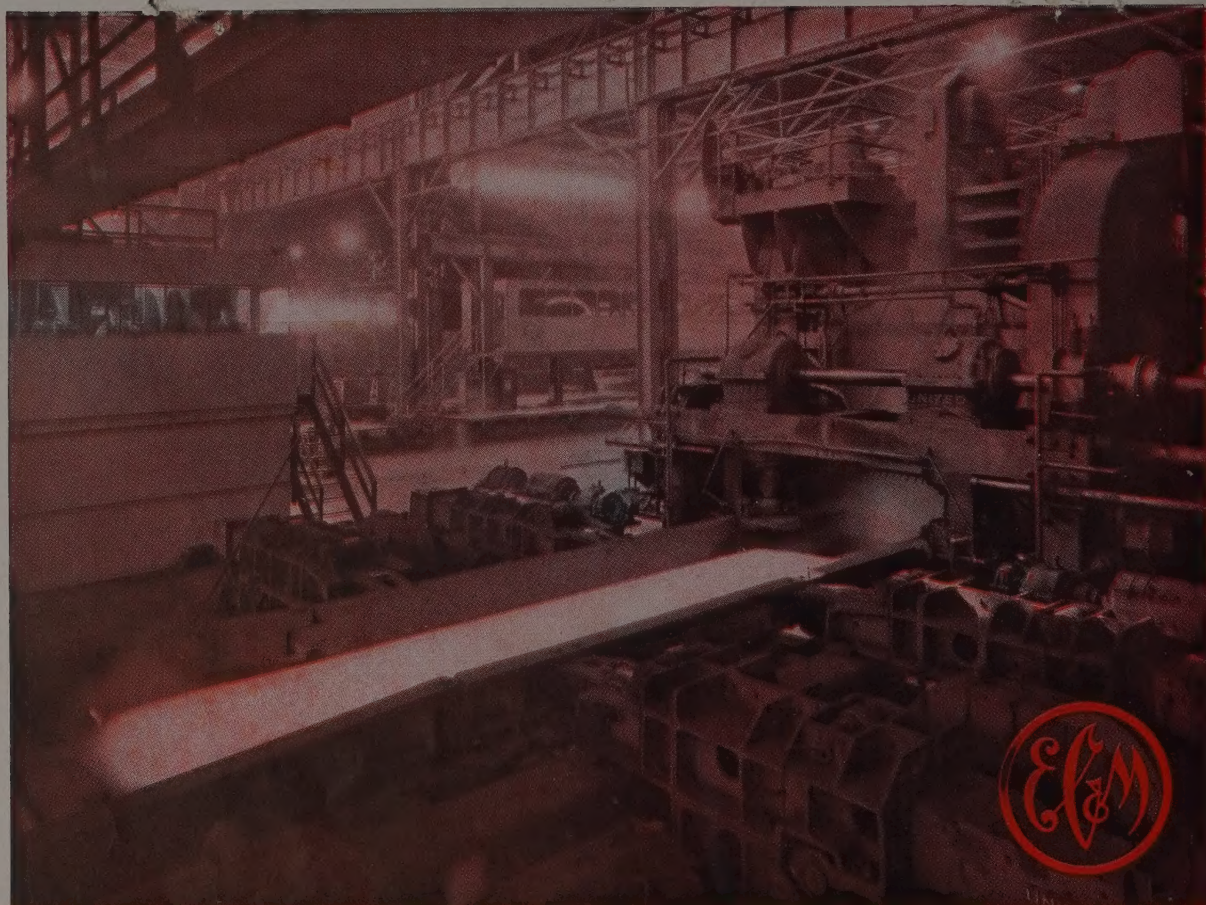
NEW DEPARTURE

forged steel

BALL BEARINGS



3462-R



Pre-Set Rolling of Plates With EC&M Automatic Screwdown Control. Screwdowns, edgers, and sideguards move to exact rolling dimensions automatically under single push-button operation. Operator is stationed in enclosed, elevated pulpit with clear view of all operations in this large, 120-inch plate mill. This simple EC&M control is used in several mills throughout the United States, resulting in improved product, faster rolling with extreme accuracy.



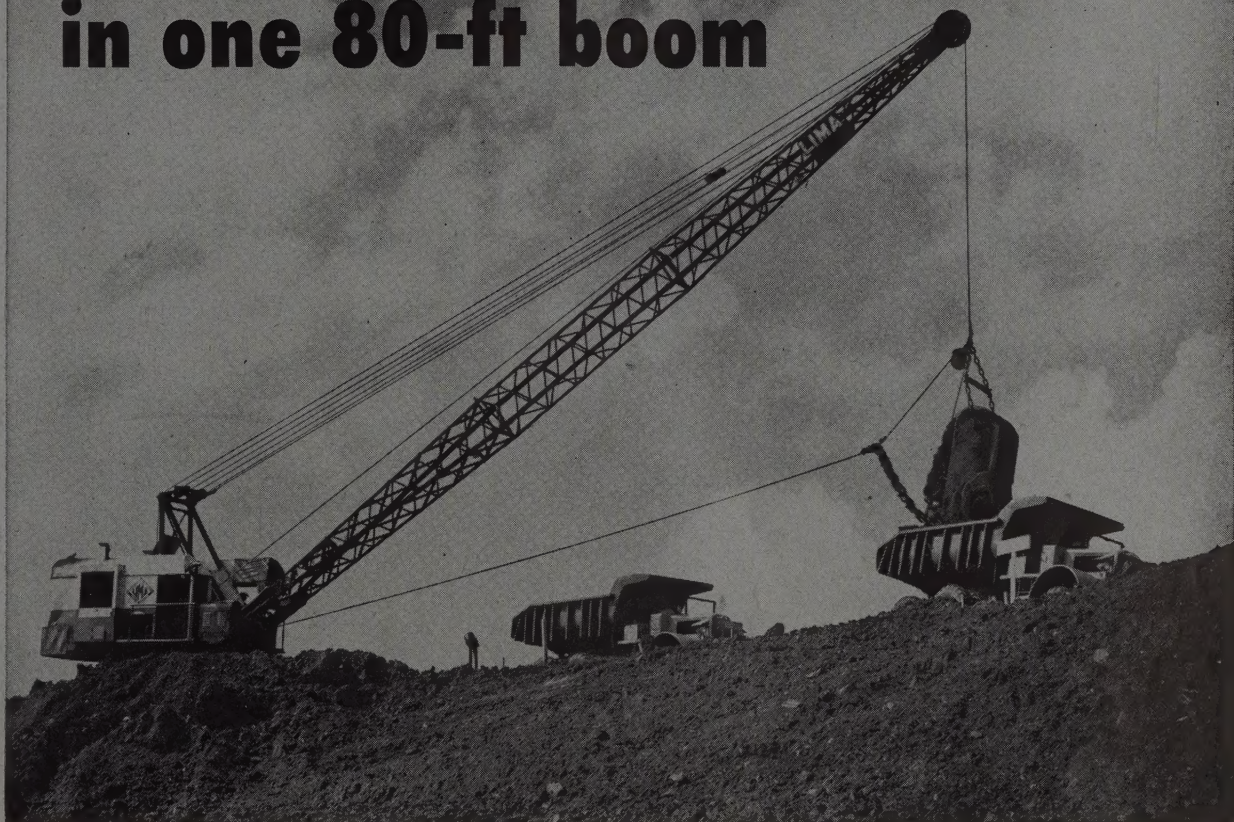
Like An Organ Player, The Operator Rolls Steel from button-panel using schedule No. 1 while an assistant prepares schedule No. 2 for a change in rolling requirements.



Also In This Same Plant Is The World's Largest Plate Mill (shown above). It has been EC&M controlled for many years.

THE ELECTRIC CONTROLLER & MANUFACTURING COMPANY, 2698 East 79th St., Cleveland 4, Ohio

Saving 1070 lbs of Steel in one 80-ft boom



This 80-ft dragline boom weighs 1070 lbs less than a similar boom built entirely of carbon steel.

The builder, Lima Locomotive Works, Incorporated, used chord angles of Mayari* R high-strength, low-alloy steel to bring about this 15 pct weight-reduction.

By using Mayari R they saved more than one-half ton of steel per boom, a worthwhile consideration from the standpoint of materials. They also built a far more efficient machine. The decreased weight of the boom near the boom-point allows greater bucket-capacity. The reduced rotating-weight of the boom results in better overall performance of the dragline.

Mayari R has mechanical properties that aid in the design and building of many types of construction equipment. With its minimum tensile strength of 70,000 psi and minimum yield point of 50,000 psi it can be used in lighter sections to reduce deadweight. It

has high resistance to atmospheric-corrosion, a particularly important advantage wherever lighter sections are used.

Mayari R is readily workable. It can be cut, formed, machined and welded with the same equipment used for ordinary carbon steel.

For detailed information on this steel and its widespread applications write for the Mayari R catalog.

**Mayari rhymes with "fiery."*

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation*



Mayari R *makes it lighter...stronger...longer lasting*



MULTIPLE *Savings*

Here one Cincinnati Press Brake producing steel cabinets has replaced a battery of machines—changed repeated floor-to-floor handling to one simple hand-to-hand transfer. The work is merely passed from man to man along one machine to complete the series of operations.

Marring has been practically eliminated, product has been improved, investment lowered, floor space conserved.

Perhaps a similar saving might be effected in your shop. Send us your problem.

Write for Catalog B-2

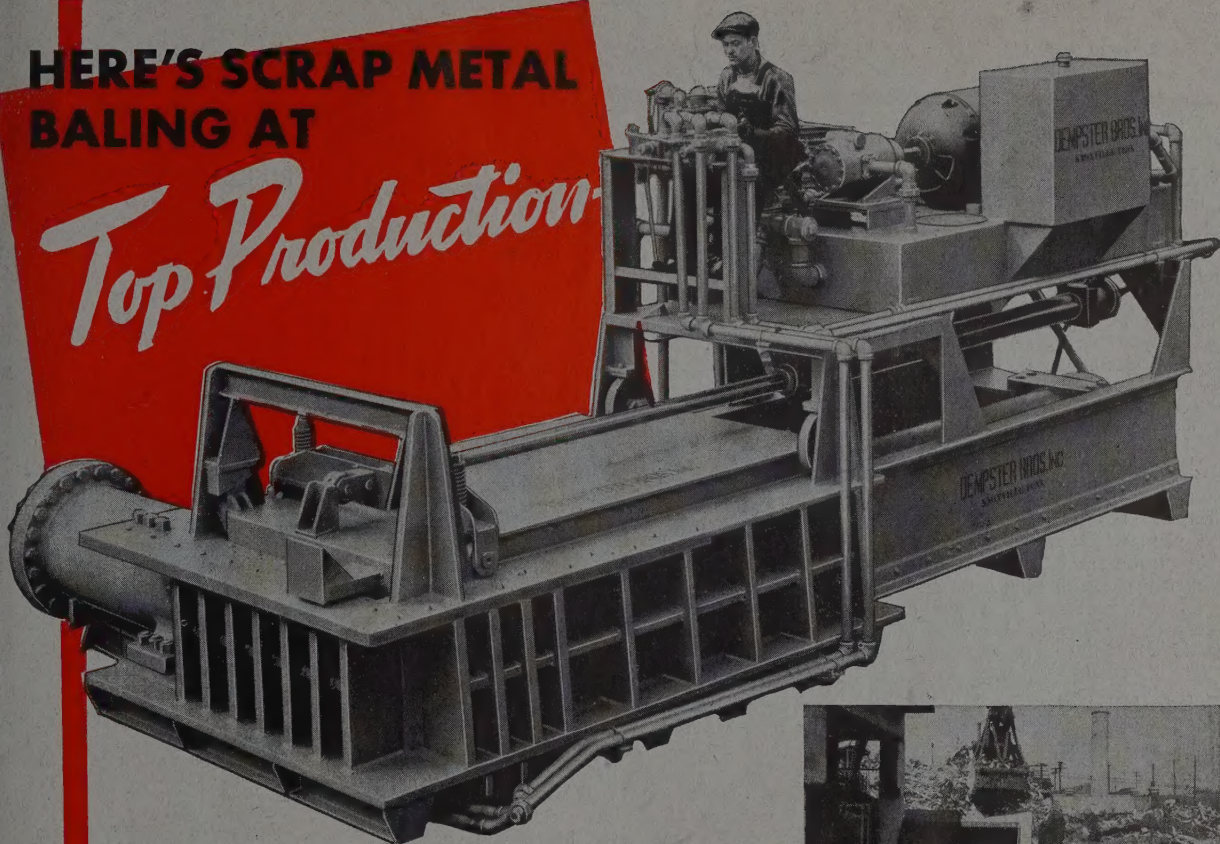


THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.
SHAPERS • SHEARS • BRAKES

**HERE'S SCRAP METAL
BALING AT**

Top Production



The Dempster-Balester, Model 275, is setting production records everywhere because it's built to deliver the high speed service that top production demands. On the Dempster-Balester, all points of strain are built oversize to withstand internal stresses beyond the normal needs of baling. The charging box is carefully squared and completely lined with $\frac{3}{4}$ " abrasion plates from which all roughness and high spots have been machined off. This rugged, dependable machine delivers uniform, high density 275 pound bales that are easily handled from baler to furnaces. For complete information and illustrated literature write or wire today.

**DEMPSTER
BALESTER**

TRADE MARK REG.



Photographs show a Dempster-Balester Model 275, with loading pan, set in a pit for ground level loading. Above, top: Scrap being dumped in charging box by loading pan.

Above: View of hydraulically operated loading pan in dumping position. Left: Finished bale held in place by ejector while charging box door comes forward to push it off of the press. Bales are forced onto roller conveyor, then power conveyor hoists them into rail-road cars.

DEMPSTER BROTHERS, INC., 557 Springdale, Knoxville 17, Tennessee

Behind the Scenes...

STEEL

Vol. 120—No. 19

May 12, 1947

Classy Classifiers

The people on our staff who have the job of classifying all plants in the metal-working industry according to the products they manufacture sometimes have a tough job. It often happens that the company makes highly technical products whose names are so much greek to our classifiers, things like tranner bars or collect connectors. Then there are the companies whose products cover such a wide range that it's impossible to spot them in any of the government industry classifications. The boys and girls do a pretty good job, however, and most of their classifications are logical. Like the plant which reported the other day they made such unrelated items as barbecue pits, shopping carts and brewery barrel handlers. That was easy—it became a materials handling classification with little or no difficulty!

Cultural Relations

We get all kinds of requests for information from all over the world, nearly always technical in nature. Once in a while some general question slips through, but thus far we haven't considered ourselves particularly firmly entrenched in the cultural side of things. Appears as how our definition of cultural is wrong, though. The other day we received a letter from the U. S. S. R. Society for Cultural Relations with Foreign Countries, a Moscow outfit. The letter was from Ivan D. Khmarsky, Chief of the American Department, and the cultural subject friend Ivan was interested in had to do with the film-impact method of casting metals. Since we had published some material on this cultural subject, as well as a lot of other cultural subjects having to do with the metal-working industries, we were able to send along some tear sheets to Ivan, and may he have no trouble in translating them.

Better Start Now

The publicity drums are beginning to be heard a little louder now, heralding the coming of the machine tool show. By midsummer that small rumble we're beginning to hear now will have become a mighty roar and the typewriters will have reached a fever pitch. Miles and miles of stuff will have been ground out, and everyone will either have a room in Chicago or will have found out that none can be had. We've heard some wild tales already. Like the Detroit gang, for example, who plan to fly back and forth every day, on the premise that it takes almost as long to get from the Loop to the Dodge plant, which is near the Chicago airport, as it does to fly from

Detroit airport to Chicago. Whether you expect to employ such strenuous measures as that or not, we hope you are planning to spend several days at the show in September, and it isn't a bit early to get everything set right now.

Puzzle Corner

The answer to the tank problem turns out to be 24.43 inches above the bottom of the tank, and the first correct answer came from Ralph Pappenheimer, Specialty Device Co., Cincinnati, who has sent in correct answers before in this series of puzzles. Other correct answers have come from a number of you, and in fact, we haven't yet received a wrong answer. This week's number is an intriguing bit from R. D. Colinet of Industrial Research Laboratory, Philadelphia. Mr. C. says that since steel sheets are scarce, we have to try to get the most out of what tonnage is available. The problem is to build a pan from a square sheet, getting the maximum capacity possible. All you are allowed is a rule, a shear, a brake and a welder, plus a brainstorm. We'll let you take any size square of steel you want, and use any design you prefer, but if you want to make it easy for us, get the dimensions and volume of the pan in terms of the length of one side of the sheet, because that's the way we have the answer written down.

Poems a la Shrdlu

No poems have been seen around this yard of tripe for a long time, so we hope you'll pardon us if we consult the muse but briefly and come out with this one:

Purchasing Agent's Lament

This year will surely bring depression,
And Wallace foresees World Aggression.

In books we read of World War Three,
Atomic bombs we'll have to flee;

The Russian Question is perplexing.
Inflationary matters vexing.

Just thinking of these problems serious
Should really have me quite delirious.

But no such problems knit my brow—
I need some cold rolled steel—and how!

It is probably only proper to remark at this point the purchasing agent is meeting a few salesmen on the road these days after a long time in which his only companions in the club car were other purchasing agents and expeditors!

Shrdlu

(Editorial Index—page 67)

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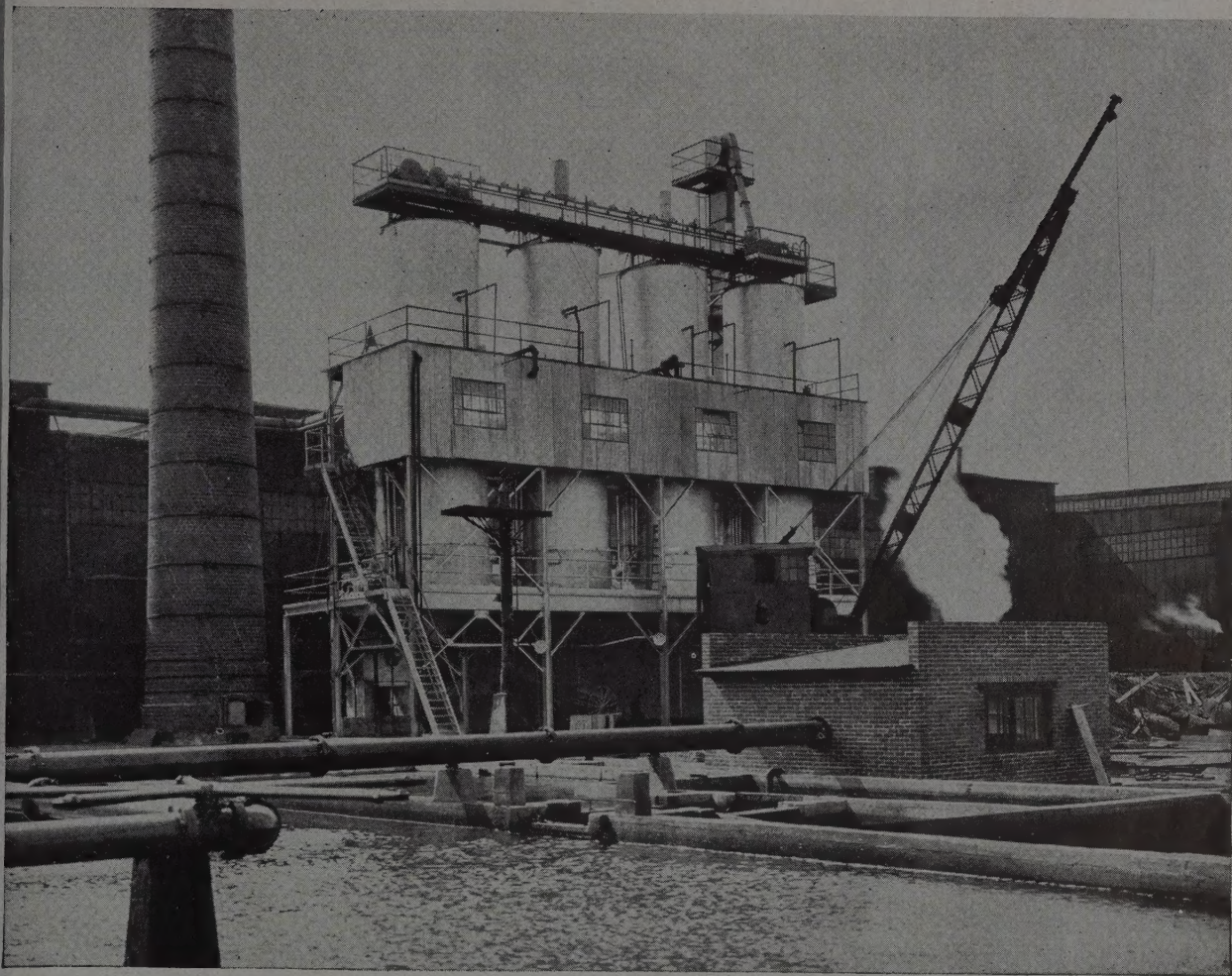
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Editorial Staff on Contents Page





Save on fuel with the **WELLMAN-GALUSHA CLEAN GAS GENERATOR**

**WELLMAN
WILL BUILD IT!**

Car Dumpers
Gas Producer Plants
Gas Flue-Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Ore Bridges
Skip Hoists
Clamshell Buckets

FUEL costs are usually lower when there's a Wellman-Galusha Generator on the job. It delivers a clean, dependable and uniform supply of gas in quantities and with characteristics to suit your individual requirements.

This gas can be used for all furnaces and kilns in the manufacture of ceramic ware, for chemical processes requiring special composition, and for all heating requirements in the manufacture of steel and non-ferrous metals.

THE WELLMAN ENGINEERING COMPANY
7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

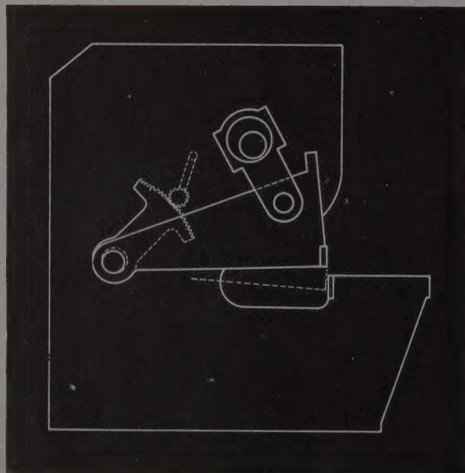
NO OTHER SHEARS ARE LIKE STEELWELD

RADICALLY DIFFERENT WITH REVOLUTIONARY FEATURES

Users from coast to coast are acclaiming the merits of Steelweld Shears. These power-driven metal-cutting machines are different from all other shears on the market. They represent the greatest advancement in shear design in decades.

A revolutionary pivoted-blade principle is employed that makes possible several outstanding advantages and overcomes certain handicaps of

present-day guillotine type shears. There are no slides and guides to wear out of true and cause inaccuracies. The upper blade operates on two heavy pivot pins secured to the end housings



and travels in a circular

The knife clearance is adjusted to suit the plate thickness by turning a convenient hand crank. A large dial indicator shows the thickness may be cut for any knife set

A complete line of Steelweld Shears has been developed for cutting plate of all thicknesses from 12 gauge to 1 1/4 inch

for lengths of 6 feet to 18 feet. They may be arranged for squaring, slitting and notching. Speeds range from 60 strokes per minute on the smaller sizes to 25 strokes per minute on the largest shear.

3 Outstanding Features

1 UPPER KNIFE TRAVELS IN CIRCULAR PATH



Blade turns on pivot pins. No guides and slides, as in guillotine-type shears, to wear and cause inaccuracies. Upper knife swings away from lower one, increasing distance "A" from back gauge to stationary knife, thereby permitting sheared pieces to drop freely without binding.

2 FAST KNIFE ADJUSTMENT



Knife clearance easily and quickly made to suit every plate thickness. No bolts to loosen; no parts to move. It is only a matter of turning a crank and watching the indicator which indicates the clearance in thousands of an inch and also shows the plate thickness that may be cut for any knife setting.

3 COUNTERACTING SHEAR PRESSURE

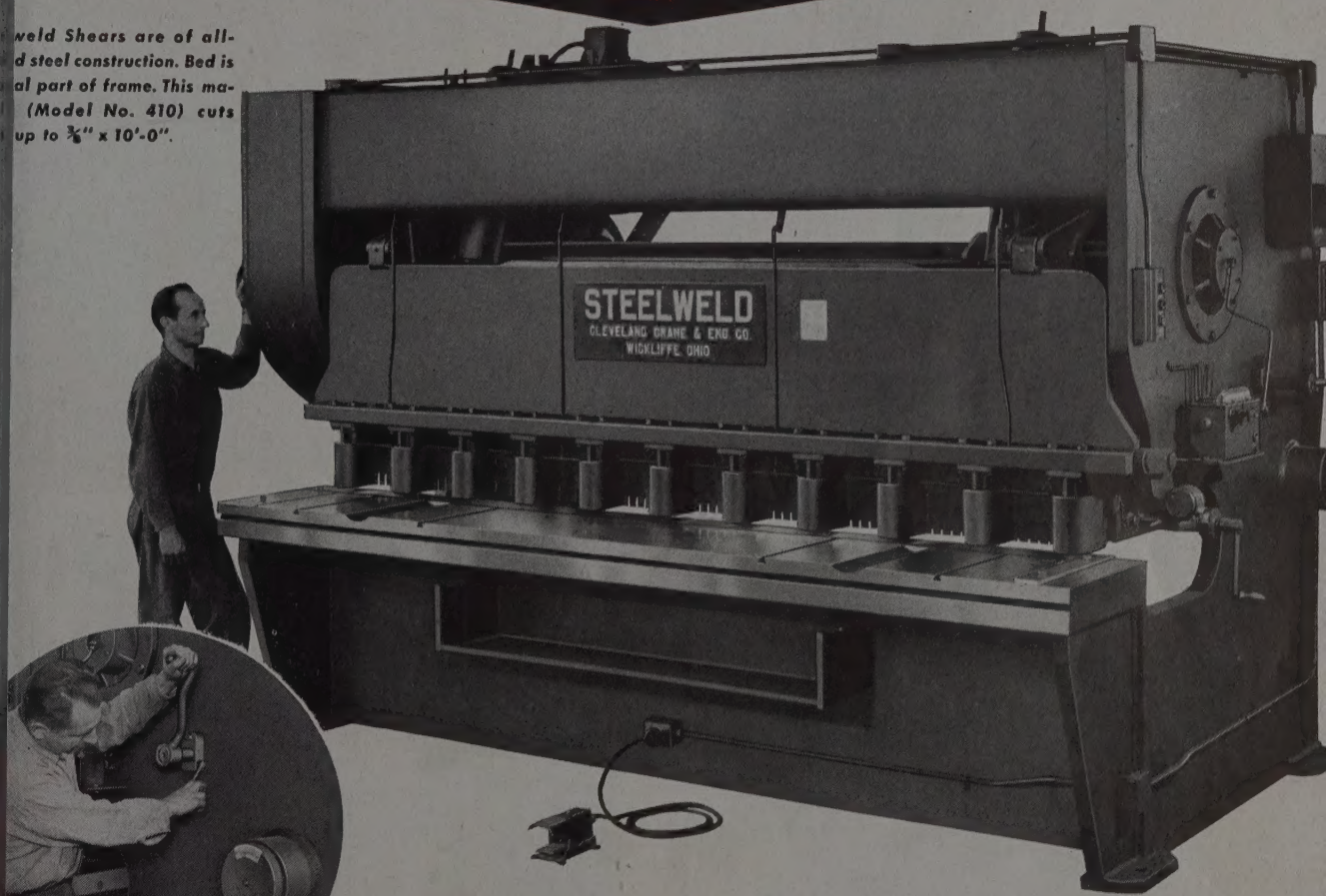


The shearing force is so applied that its horizontal component "A" will be approximately equal and counteract pressure "B" that develops in the knife during shearing, tending to open them apart. This reduces the load on the blade pivot pins to a negligible amount and assures long trouble-free life at these points.

3 IMPORTANT ADVANTAGES

1. Knife clearance easily adjusted to suit plate thickness.
2. Smooth, clean cuts.
3. Accurate, straight and true edges.
4. Easy and simple to operate.
5. Fast cutting and high production.
6. Convenient electric foot control.
7. No slides or guides to wear.
8. Trouble-free mechanical hold-downs.
9. Easily arranged for squaring, slitting or notching.
10. Convenient back gauge.
11. Negligible twist, camber and bow in cut pieces.
12. Quiet operating.
13. Designed for safety throughout.
14. Long knife wear between grindings.
15. Knives easily removed or replaced.
16. All-welded one-piece frame with bed integral.

Weld Shears are of all-steel construction. Bed is an integral part of frame. This machine (Model No. 410) cuts up to $\frac{3}{4}$ " x 10'-0".



Turning this convenient crank changes the knife clearance. The indicator shows plate thickness that may be cut for any knife setting.

Electric foot switch operation is a standard feature on all Steelweld Shears. Easily operated by toe action, the switch can be slid around the floor to wherever most convenient.

GET THIS BOOK!



STEELWELD

PIVOTED BLADE

SHEARS

THE CLEVELAND CRANE & ENGINEERING COMPANY
7806 EAST 282nd ST. • WICKLIFFE, OHIO

for smooth
precision
DRILLING



FILL YOUR DRILL PRESS
NEEDS FROM "THE WORLD'S
MOST COMPLETE DRILL
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The smooth, precision performance of the CANEDY-OTTO line reflects our 54 years of drill press experience; the modest initial and upkeep costs of a CANEDY-OTTO Drill Press reflects a pricing policy that gives you, dollar for dollar, the greatest values obtainable in drill presses. Order ALL your drill press requirements from this one source and enjoy the benefits of uniform, precision, CANEDY-OTTO production throughout your plant. Before you specify or buy new drill press equipment, review the complete CANEDY-OTTO line.

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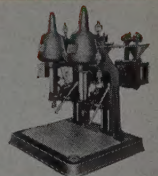
DRILL PRESSES



16" No. 1000 F.V. 1-Spindle
Box Column Floor Drill



2-Spindle 21" Box Column
Sliding Head Floor Drill



16" No. 5-10,000 B.V.
2-Spindle Bench Drill



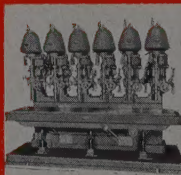
21" Box Column
Sliding Head Floor Drill



21" Sliding Head
Floor Drill



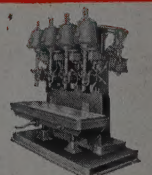
16" No. 3000 F.V. 2-Spindle
Box Column Floor Drill



4-Spindle 21" Box Column
Sliding Head Floor Drill



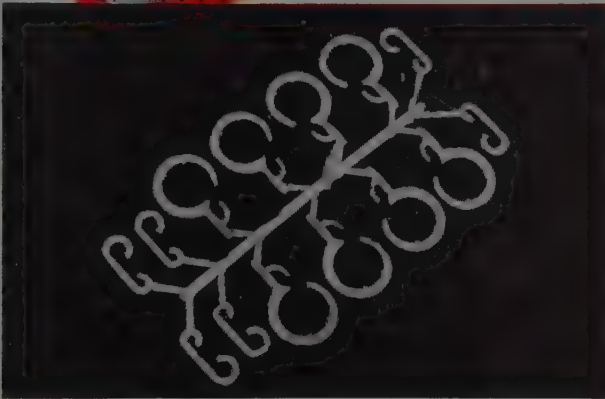
14" No. 3000 F.V. 1-Spindle
Sensitive Floor Drill



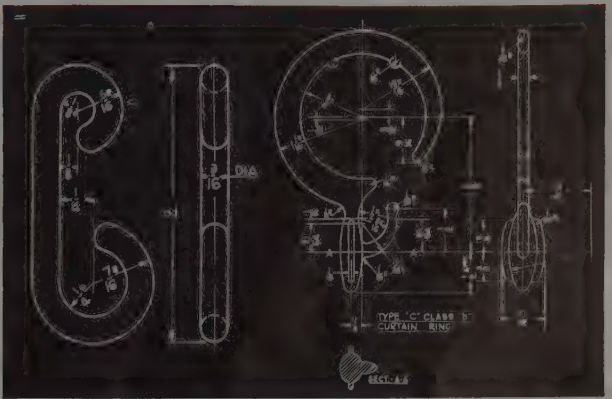
4-Spindle 21" Box Column
Sliding Head Floor Drill



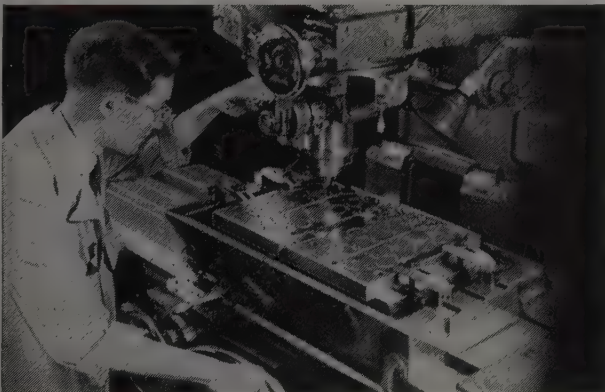
How to Layout and Mill a 14-Cavity Injection Mold — Complete in 52 Hours



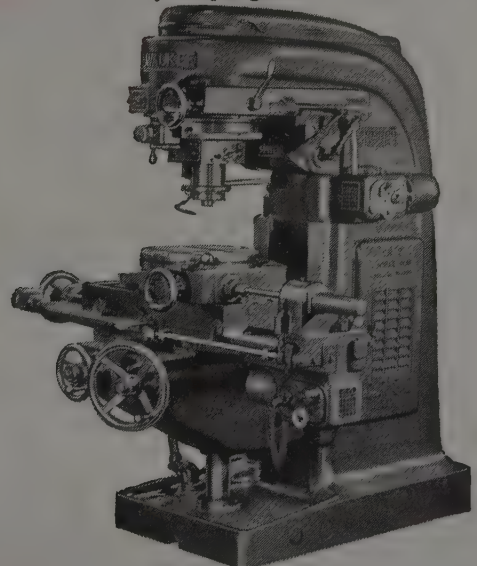
1. FAST! Both halves of the 14 cavity injection mold for these plastic shower curtain hooks were set up as a single workpiece or unit on the Kearney & Trecker Rotary Head Milling Machine table. All operations completed in this single set-up . . . changing only the special form cutters as required.



2. DIRECT! The operator accurately located the mold blocks in relation to the Rotary Head center. Scriber held in machine spindle laid out one cavity of each shape. No models or templets used — blueprint was only guide the operator used. Other cavities located by simple geometric construction.



3. ACCURATE! Completing work in single set-up reduced chance for error. Each operation performed on location of scribed layout and repeated on each additional cavity. Uniform precision results from this multiple origination method. Precise control of all cutter movements makes this possible.



For more facts on how you can get Fast, Direct, Accurate results on other mold, tool, die, pattern, toolroom and general production work, using the Rotary Head Method, write for bulletin 1002C on the Model 2D Rotary Head Milling Machine.

**KEARNEY & TRECKER
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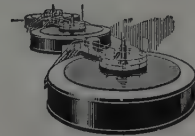
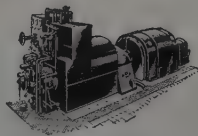
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Reproduced from an Old Engraving in Sears Pictorial Description of the United States Published 1848



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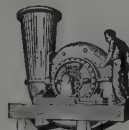
Motors —
All Types



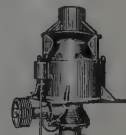
Texrope
V-Belt Drives



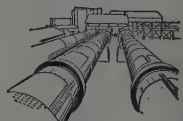
Centrifugal
Pumps



Blowers &
Compressors



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Mining Machinery



Chemical & Pyro-
Process Equipment

Chief?

We were here when Milwaukee was spelled M-I-L-W-A-U-K-I-E!

MILWAUKIE, 1847 — A struggling frontier settlement celebrates its first birthday... and a small factory in the center of town begins turning out its first product — *millstones*.

One-hundred years later, in 1947, this progressive metropolitan city salutes its oldest heavy machinery manufacturer — Allis-Chalmers . . . *one of the Big 3 in electric power equipment—biggest of all in range of industrial products!*

It is significant to know that today, practically every U.S. manufactured product is aided somewhere along its course by Allis-Chalmers equipment.

In building a *better* millstone, crusher, turbine, motor, V-belt drive — Allis-Chalmers has earned the respect and confidence of men in every industry.

* * *

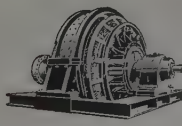
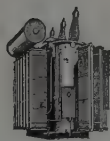
Allis-Chalmers is proud to serve this basic pattern of American industry and economy: Power and Electrical — Mining and Rock-Processing — Ferrous and Non-Ferrous Metal Producing — Metal Working — Food — Textile — Chemical — Petroleum — Wood — Rubber — General Manufacturing — Transportation — Construction — Public Works — Agriculture — and National Defense.

ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2193

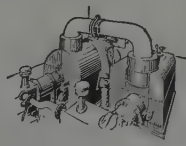
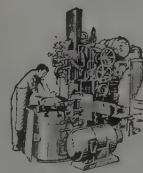
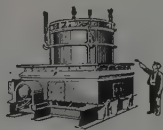
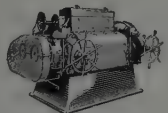
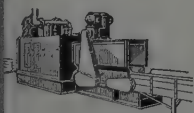
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Pulp, Paper, Saw-Mill Equipment

Food, Milling & Extraction Equipment

Precision-Casting — Foundry Equipment

Equipment for Machine Tools

Marine & Defense Equipment

Farm & Industrial Tractors

A 2193

2 Outstanding Norton RESINOID WHEELS

*Two wheels that give you
both a fast, smooth cutting
action... and long life!*

B-5

INTRODUCED a little over a year ago for wheels in the soft and medium hard range, B-5 resinoid bond has been a tremendous success. Operators like the Norton B-5 wheel because it stays sharp—cutting fast and smooth. And grinding costs are down because the fast cutting action is obtained without sacrifice of wheel life. B-5 bond produces a wheel that is mechanically strong and thereby long-lasting.

B-7

THIS newest Norton resinoid bond brings to wheels in the hard grades the same combination of fast cutting action and long life which has made B-5 so popular in the softer grades. A stronger and more heat-resistant bond, B-7 is showing remarkable cost-cutting ability on floor stands, swing frames and portable grinders.

Available with all Norton abrasives for foundry wheels, these two outstanding Norton resinoid bonds are bringing lower grinding costs to cleaning rooms everywhere. Call in your Norton abrasive engineer, or the abrasive specialist of your Norton distributor, for specific recommendations.

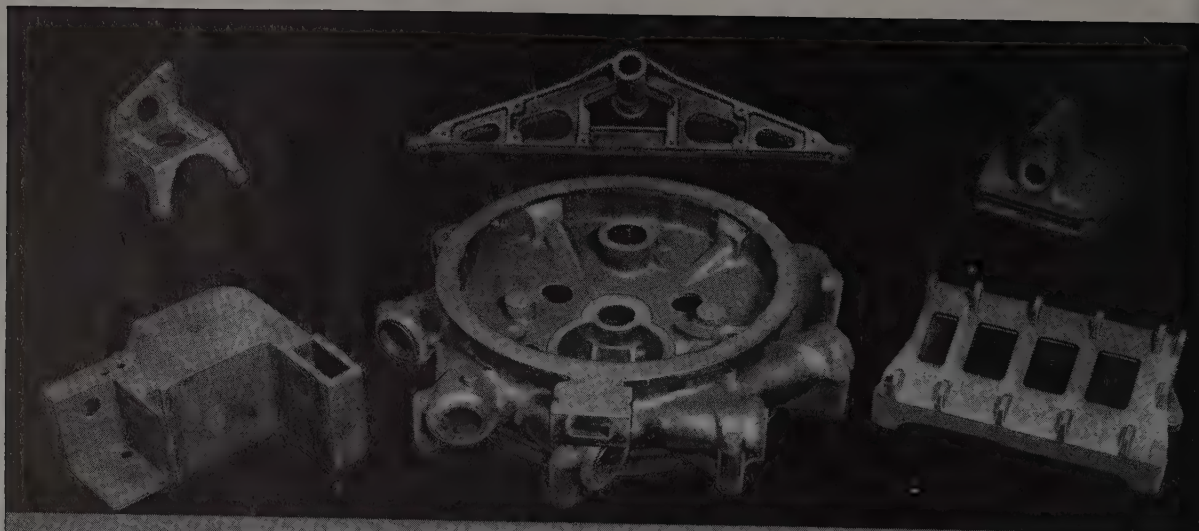
NORTON COMPANY, WORCESTER 6, MASS.

W-1105

for the Foundry!

**B-5
B-7**

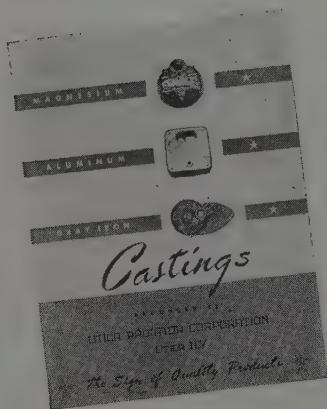
NORTON ABRASIVES



Magnesium Castings

Lighter • Stronger • Easier to Fabricate

Finished parts in Magnesium may be considerably *lower* in cost than those of the more common metals, for the remarkable machinability of magnesium is easy on tools . . . and in some instances the lowered weight ($\frac{1}{3}$ less than aluminum) makes even the rough casting less expensive than other metals! If your product requires high resistance to shock and good machinability, let Utica Radiator design engineers and metallurgists discuss your specific problems — in the light of light magnesium!



Write for this Booklet on our Production Facilities

Constant laboratory control, automatic core baking, heat treating equipment, high foundry capacity, and complete finishing processes — plus our versatile production experience — assure quality castings. The story of our production facilities is contained in our "Castings" booklet . . . write for your copy, today!

Utica Radiator Corporation

Manufacturers of Magnesium Castings for Industry

2200 DWYER AVENUE • UTICA 2, NEW YORK

Profit-stealer:

Hidden depreciation

of machine tools

SOME MACHINE TOOLS in metal turning industries show little wear and tear depreciation—can still maintain the same volume of output as the day they were installed. Yet many of these machines have undergone hidden depreciation in value because of their *inadequacy* as profitable producers.

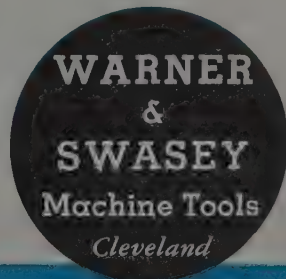
And they will continue to decrease in productive worth—as rising material, labor and overhead expenses continue to raise unit costs and cut profits—unless ways are found to boost their efficiency.

Warner & Swasey field engineers have successfully helped many manufacturers increase the productive value of their machine tools, either through new accessories for faster, easier operation, or by suggesting new tooling setups or specially devised tooling for increased production.

Frequent appraisal of machine tool productivity should be made to prevent complete obsolescence of any machine tool. The Warner & Swasey representative can quickly spot replacement needs—can suggest the *proper* machine tool for your particular operation.

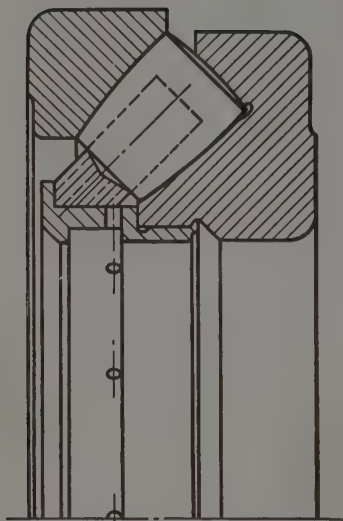
Let him show you how

*You can machine it
better, faster, for less...
with a Warner & Swasey*



TURRET LATHES, MULTIPLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

For Heavy Thrust Loads High Speeds /



● Standardized **SKF** Spherical Roller Thrust Bearing



● Double directional adaptation for 4-High Back-up Rolls

SKF Spherical Roller Thrust Bearings are designed not only for the back-up rolls of 4-High Mills, but for all severe duty applications such as worm thrust locations in screwdowns and large speed reducer units, turntables, huge high-speed pumps, etc.

Complete series of this bearing have been developed, and many sizes are available. See your nearest **SKF** representative, or write direct. 6244-A

SKF INDUSTRIES, INC.
Front St. & Erie Ave., Phila. 32, PA.

PREFERRED

SKF

Spherical Roller Thrust Bearings



BETTER ASK FOR THIS BULLETIN

NOW

If you want a fast, accurate, large-capacity drilling machine for all kinds of shop and production drilling, the "RPMster" is the machine for you! Hundreds of men use in all kinds of shops—many after years of twenty-four hour a day service. This big versatile drill changes spindle speeds instantly at the touch of lever—meets every speed requirement of all drilling from $\frac{1}{8}$ " to a top rated capacity of $1\frac{1}{2}$ " in cast iron.

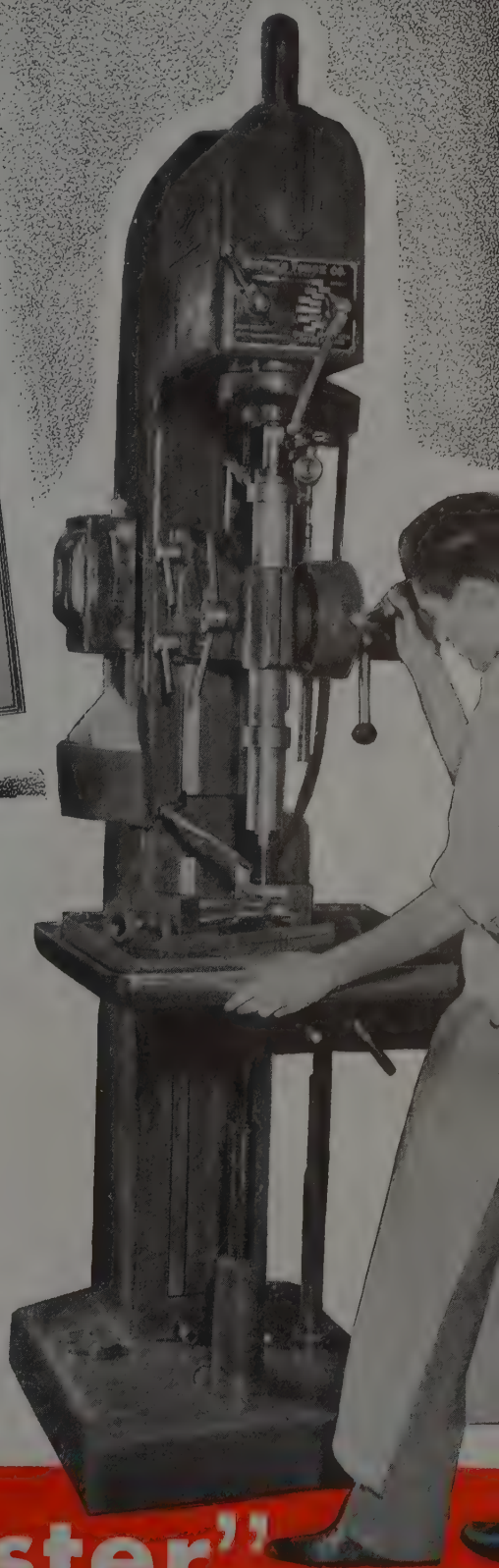
Write today for Bulletin 3257 which gives complete specifications.

BUFFALO FORGE COMPANY

58 Mortimer St.

Buffalo, N. Y.

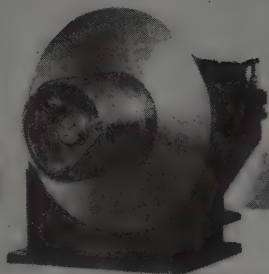
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



"Buffalo"

"RPMster"

THE DRILL WITH 101 SPEEDS



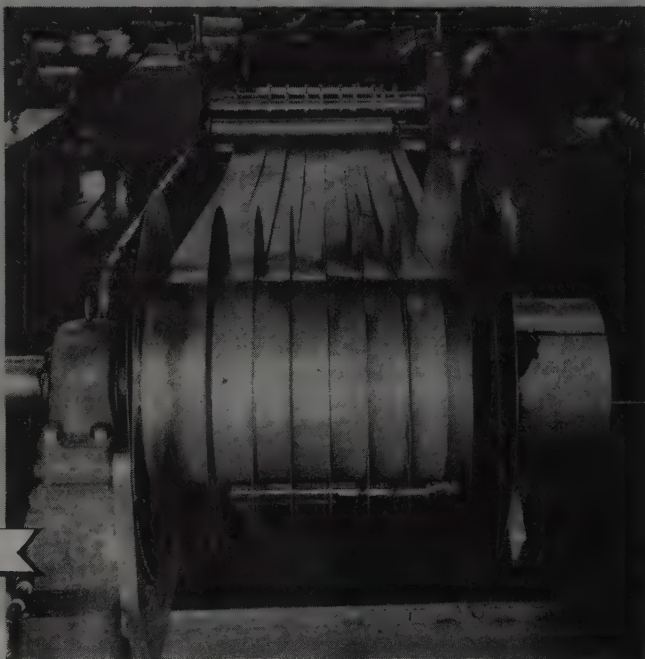
PULL-THROUGH RECOILERS



GANG SLITTERS



UNCOILERS and COIL BOXES



HIGH SPEED • LOW COST

Profiting by long and extensive experience in designing and building slitting lines to meet individual requirements, often involving heavy engineering expense, Yoder offers the best features of all combined in a standardized series for handling sheets and strip up to .125" thick and 36" wide. For speed, precision, ease of control, simplicity and rugged construction, this series

stands unsurpassed. At the same time, important economies in engineering and manufacturing cost, achieved through standardization, are shared with the purchasers.

The benefits of standardization are also being extended to Yoder slitting lines of larger capacities.

THE YODER COMPANY

5502 Walworth Avenue • Cleveland 2, Ohio



ROLL FORMING AND TUBE MILL MACHINERY

36 YEARS' LEADERSHIP • COILING • SLITTING • FORMING • EMBOSSING • CURVING • WELDING • CUTTING-OFF

IMPROVED HEAT PROCESSING OF METALS

A fast-heating process, which breaks sharply from conventional practices as a technique and as a producer of improved heating results, has been quietly establishing itself in mills and plants where metal heating, reheating and heat-treating are production operations.

The process is new. One of the commonest of industrial fuels—commercial gas—is caused to give results of a new order in speed and quality.

Equipment which applies and controls the heat is unlike that for any other technique. It represents a distinct development. For this reason, the identifying name—GRADIATION—can be helpful to men in industry who are moved to study the process and its record.

The booklet illustrated here offers a review of Gradation in the metals industry. It is a summary of principles and specific performances.

Ring gear tooth hardening

Connecting rod blanks heated for forging

Annealing in production line

Slug heating for forging

Through heating, surface heating or reheating of bars or tubing

GRADIATION

SPEED
—improves mill and plant schedules; reduces conventional hours to minutes or seconds.

IMPROVED PRODUCT
—better metallurgical characteristics from speed and automatic process-control.

SAVINGS
—in processed metal, rejects, space, time, fuel, handling, straightening, pickling, quenching.

USED FOR
—through heating for heat treating, forging, extruding, upsetting; annealing; hardening followed by tempering; surface hardening and patterned, localized heating or heat-treating.

CONTINUOUS PRODUCTION
—for ferrous or non-ferrous bars, tubes, billets, strip, wire, castings, slugs or machined parts.

UNIFORM RESULTS
—by exact reproduction in continuous or repetitive operations.

COMFORT
—with ease and safety for the operator.

FLEXIBILITY
—in accommodating size-variety in one heating arrangement.

The name Gradation implies *radiation*—high speed, high temperature, solar-like heat; it implies *gradient*—faster heating by exposing metals to superheat with precise control of heating rate; it implies *gas-radiation*—which protects the charge and is economical to apply.

Gradation is a development of Selas engineering. Whether your work with metals is producing or processing, ferrous or non-ferrous, send for the book. Ask of existing installations or of the adaptability of Gradation to your work.

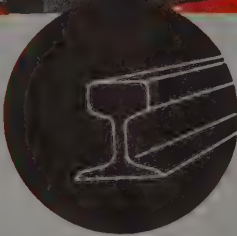
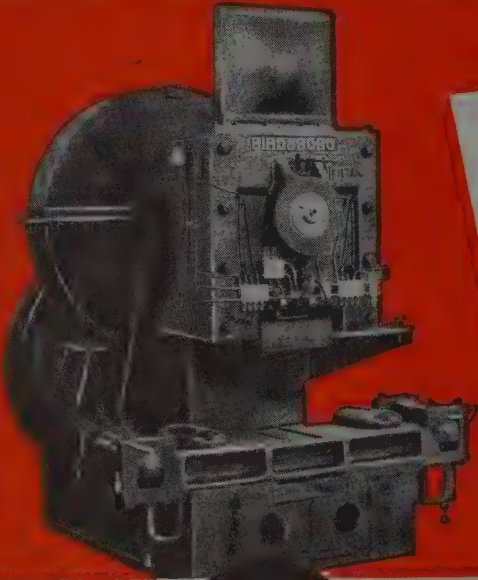
IMPROVED HEAT PROCESSING

*SELAS TRADE NAME



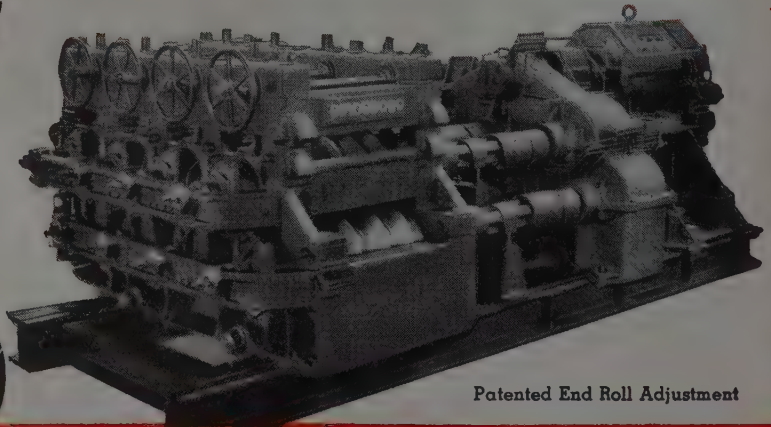
SELAS CORPORATION OF AMERICA PHILA 34 PA

FASTER, MORE ACCURATE
Straightening
 ON ANY OF THESE
BIRDSBORO
 STRAIGHTENING MACHINES

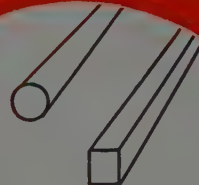
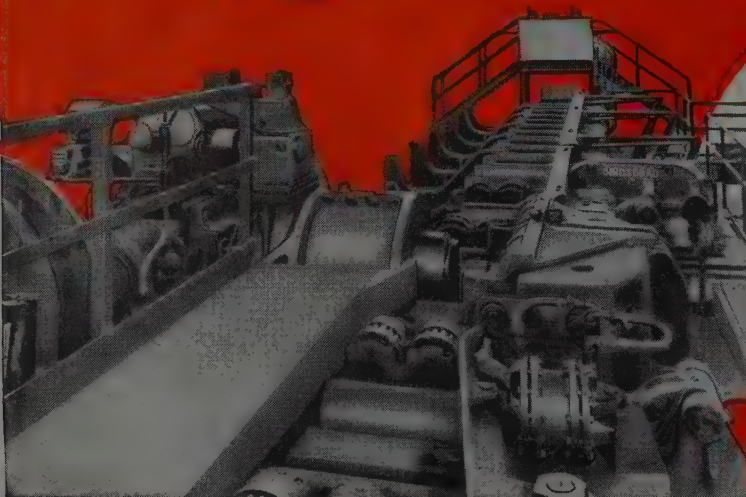


Rail Straightening Press having capacity for straightening 150 lb. rails.

Structural Shape Straightening Machine with capacity up to 6" x 6" angles.

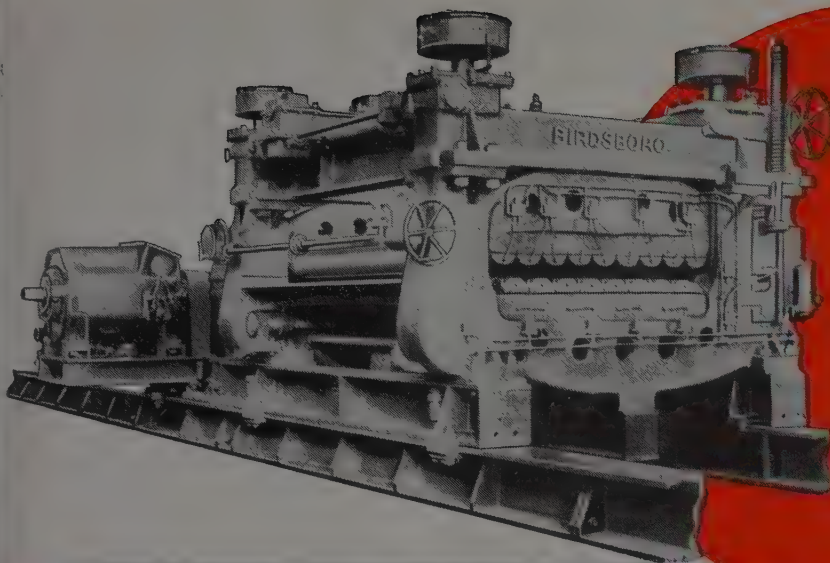


Patented End Roll Adjustment

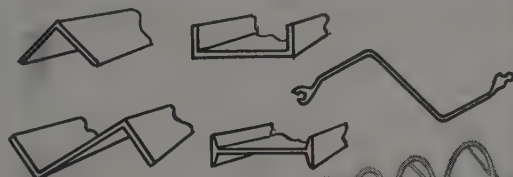


Gag Press for straightening alloy steel bars up to 9" rounds and 8" squares.

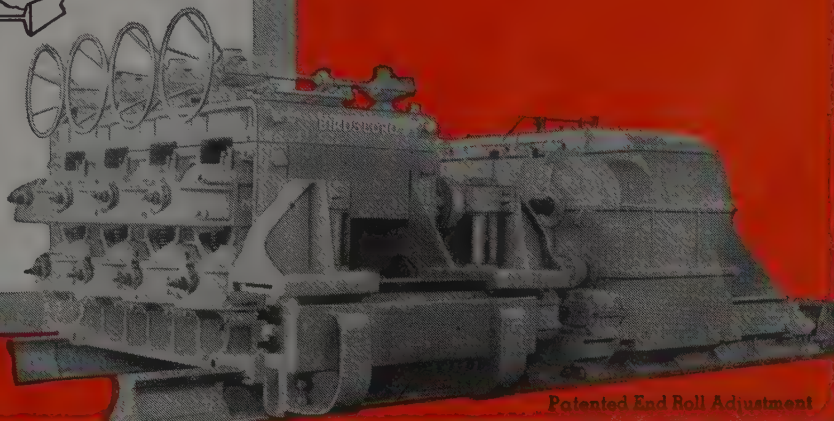
Patented Manipulator



Steel Plate Leveler handles plate up to 100" wide



Structural Shape Straightener for Angles up to 8" x 8", Channels up to 18", I-Beams up to 24" and all sizes of Z-Angles, Bulb Angles and Piling Sections.



Patented End Roll Adjustment

These five versatile Birdsboro Machines meet the major straightening needs of heavy industry. They have been designed for easy, trouble-free operation and built for rugged service . . . with recently developed features that reduce production costs. When your problem involves the straight-

ening of any metal shapes in large or small sizes, investigate Birdsboro's facilities for producing machinery to meet your specific requirements. Our designers and engineers will welcome the opportunity to work with you to arrive at a practical solution to your problem. Get in touch with us today.

BIRDSBORO STEEL FOUNDRY & MACHINE COMPANY • BIRDSBORO, PENNSYLVANIA
Manufacturers of Steel Mill Equipment, Iron and Steel Rolls, Hydraulic Presses, Crushing Machinery, and Special Machinery

BIRDSBORO

STEEL MILL EQUIPMENT

EXPERIENCE is knowledge gained by practice. Experience gained over a period of more than 30 years is reflected today in every operation in each of the four modern Allied plants.

EXPERIENCE

PRECISION
ALLIED
CORPORATION
PRODUCTS
OF DETROIT, MICHIGAN

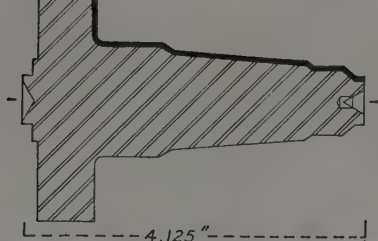
ALLIED PRODUCTS CORPORATION

DEPARTMENT 33

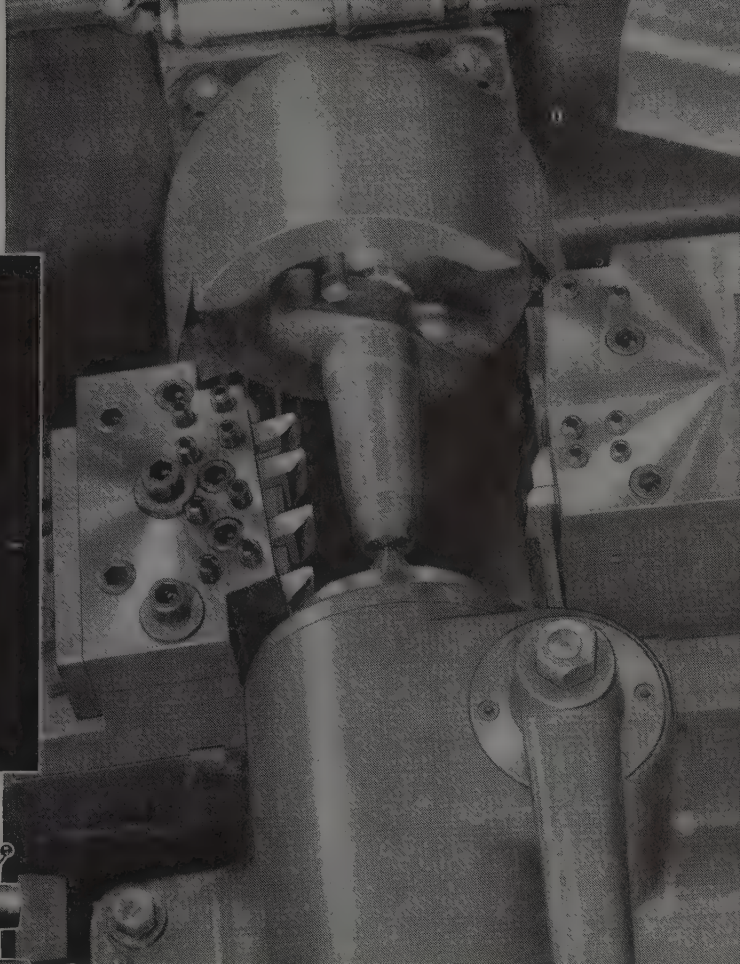
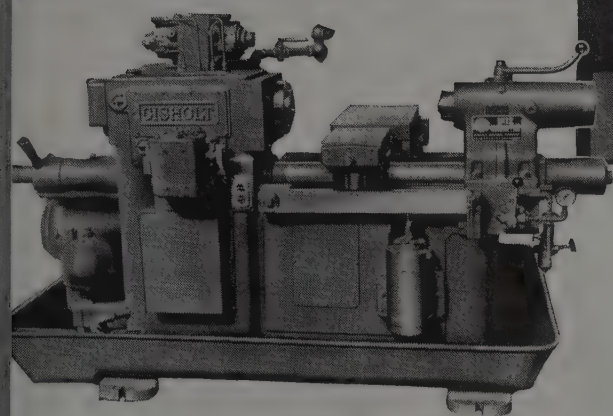
4628 LAWTON AVENUE

DETROIT 8, MICHIGAN

SPECIAL COLD FORGED PARTS • STANDARD CAP SCREWS • HARDENED AND PRECISION GROUND PARTS
SHEET METAL DIES FROM THE LARGEST TO THE SMALLEST • JIGS • FIXTURES • STEAM-HEATED PLASTIC MOLDS
SPECIAL PRODUCTION TOOLS • R-B INTERCHANGEABLE PUNCHES AND DIES • DIE MAKERS' SUPPLIES



**take a
Short Cut
on all cuts**



with the **GISHOLT** *Hydraulic Automatic Lathe*

HERE's a typical example of the ability of the Gisholt No. 12 Hydraulic Lathe to profitably combine a number of cuts in one operation.

In the machining of a type of Diesel Engine Injector Body (material—SAE 4150 steel forging, in lots of about 1000), *one* No. 12 operation is accomplishing the same work that formerly required two operations, one on each of two less versatile automatic lathes. And this work, which used to take about 5 minutes per piece to perform, is now completed in *1.5 minutes on the No. 12.*

Comparable savings are being realized on two other similar types of injector bodies, with rapid changeover, through the machining advantages of the Gisholt Hydraulic Lathe.

One reason so many jobs are done faster on the Gisholt No. 12 lies in the wide latitude of tooling arrangements it makes possible. Oper-

ations such as taper turning, forming, angular facing, constant speed radius cutting and intermittent facing can be efficiently combined with orthodox turning, facing, boring, and grooving.

Investigate the characteristics of this advanced automatic lathe that give it such remarkable earning power.

GISHOLT MACHINE COMPANY

Madison 3, Wisconsin



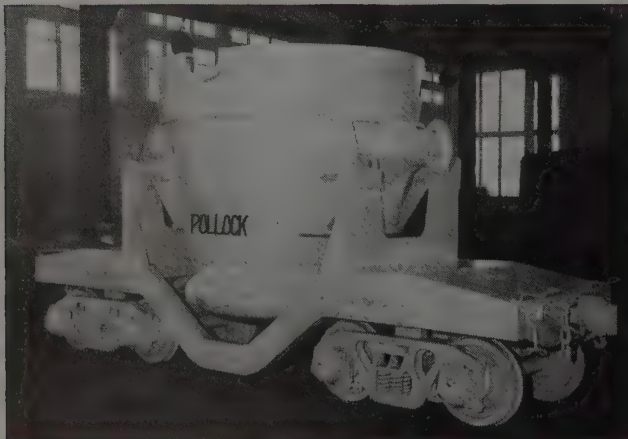
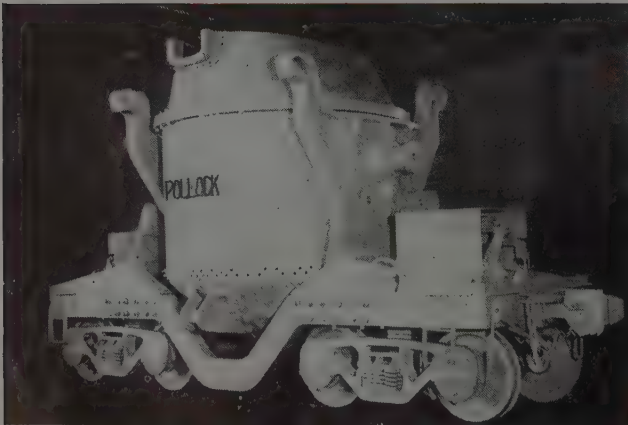
THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface finishing and balancing of round and semi-round parts. Your problems are welcome here.

STANDARD OR SPECIALLY-MADE HOT METAL CARS . . .

POLLOCK

builds all types



Pollock hot metal cars are made in various capacities up to 95 tons, and can be built larger, depending on railroad clearances. The widely-used Kling type was introduced by Pollock for special heat-retaining properties, and both the Kling and Open-top type can be made for long pouring or short pouring. The car bodies are of welded steel construction—either all-welded in one piece, or with end and side frames bolted together to save space in shipping. Trucks have A. A. R. standard wheels, axles, bearing brasses and springs. In addition, special end-thrust bearings can be provided where standard A. A. R. bearings wear too fast, or roller bearings of your choice can be provided. Cars can be equipped with K brakes or AB brakes.

Pollock Company engineers will be glad to make a study of your hot metal handling requirements, and recommend the equipment best suited to your individual needs. Just call or write today—our trained experts will do the rest!

POLLOCK

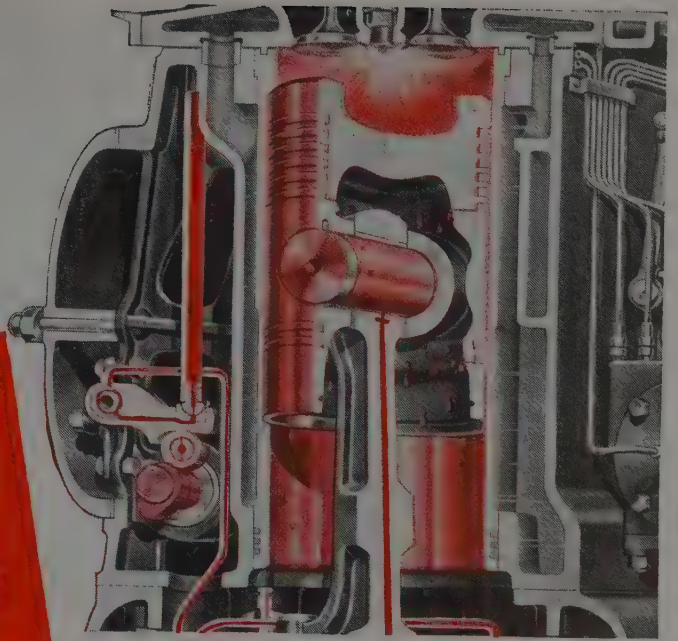
THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN • OHIO

STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • ERECTORS

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

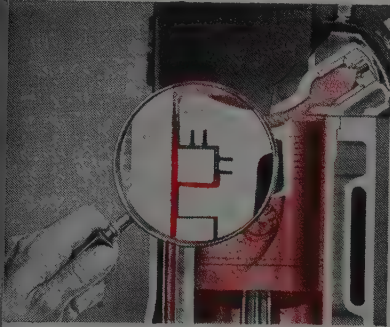


*This Man "Sees"
Inside
Your Machines*



YOUR Socony-Vacuum Representative is a Sales Engineer, trained through years of experience in the lubrication of industrial plants of all kinds. He

thinks in terms of the inside of your machines. He knows bearings, cylinders and gears . . . the operating difficulties that must be met and overcome. Called into your plant to help you obtain maximum machine efficiency, he works with your own engineers, a friendly expert adviser . . . on your staff but not on your payroll.

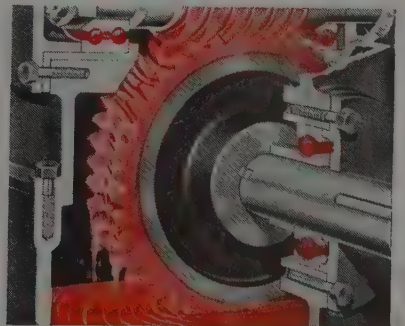
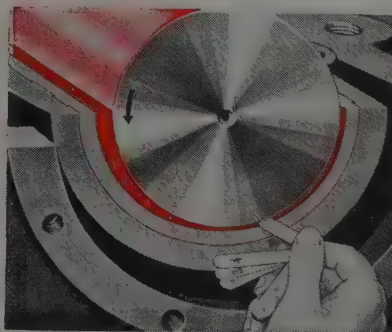


Studies Operating Problems

Every unit in your plant has its own operating characteristics. For instance, the loads on certain gears, the temperatures of bearings. Your Socony-Vacuum Engineer studies all factors.

Recommends Correct Lubricants

With all the facts about your machines, your Socony-Vacuum Engineer is able to recommend the right Gargoyle oil or grease and the best application technique for every problem.



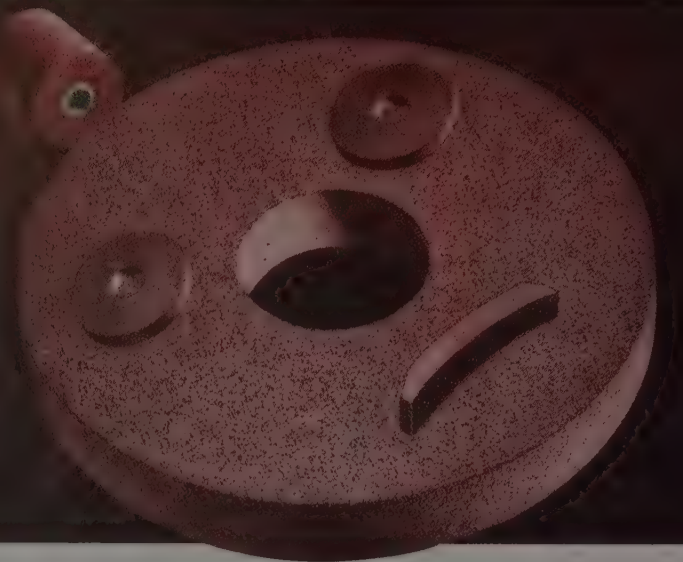
Sets up a Lubrication Program

Your Socony-Vacuum Engineer provides complete lubrication schedules. He helps with storage problems and lubrication training. Finally, he prepares progress reports on the benefits obtained.

The Inside Track to Profits . . .

**Socony-Vacuum
Correct Lubrication**





Let's look grinding costs in the face

You may get a surprise when you look your grinding costs in the face.

You may find profits wearing down with every turn of the wheel.

Here's our proposal to bring your grinding costs to rock bottom: let Peninsular engineers give your grinding operation a complete study—your machines, the materials you grind, the wheels you use.

From this study, Peninsular will develop grinding wheels to keep your production costs down. For 58 years,

Peninsular engineers have been performing this service for industry.

They have learned that each grinding job has its special needs. *Every* Peninsular grinding wheel is specially made for its particular job.

The Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit 7, Michigan. *Sales Offices:* Chicago, Philadelphia, Boston, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

PENINSULAR

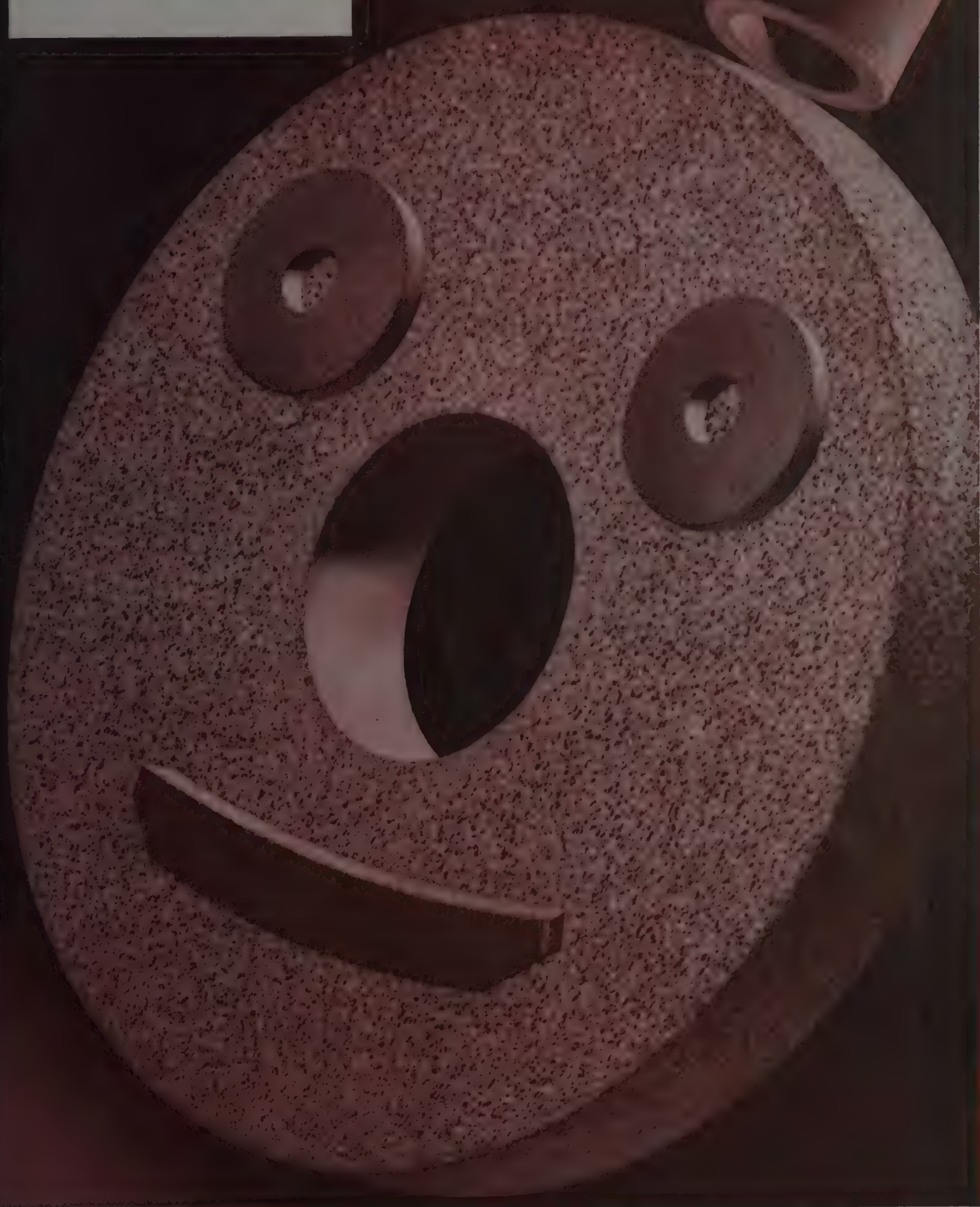
INDIVIDUALLY  ENGINEERED

GRINDING WHEELS

SINCE 1889

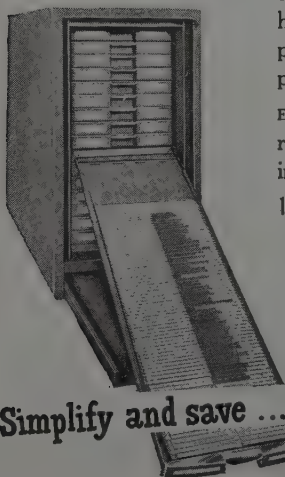
SPECIALISTS IN RESINOID BONDED WHEELS

This Peninsular "face" is a disc wheel for rough grinding, with smaller photographs of the same wheel for eyes, the mouth a surface grinding segment edge, and the hat a cylinder wheel for surface grinding.





Can your profits afford to foot THIS bill?



Simplify and save ...with KARDEX

It's a dangerous habit to accept ALL of today's higher costs. For many *controllable costs* can be profitably reduced by simplifying systems and procedures throughout your business.

EXAMPLE: One typical company replaced their rule-of-thumb purchasing procedures with an integrated Remington Rand system. Results:

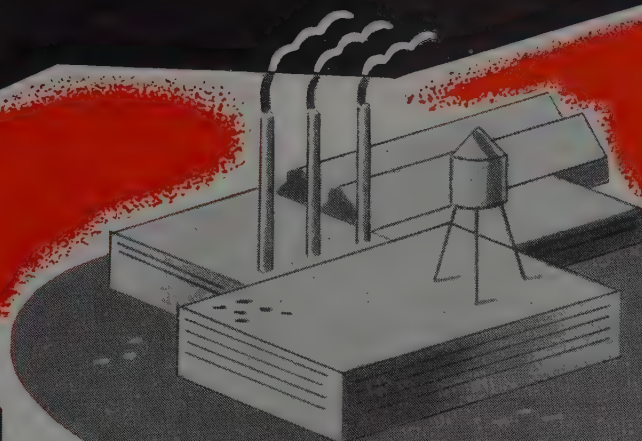
- 1 *Analysis of sources of supply, past prices, and delivery performance has been streamlined with Kardex visible control. Executive and clerical overtime has been sharply reduced.*
- 2 *Expediting and delivery follow-up has become automatic through the use of Visible Tip follow-up folders. More time and money saved!*
- 3 *Point-of-use record protection has combined record safety with operating efficiency.*

Whether your costs are high in sales...inventory...production...or ledger...Remington Rand simplified systems can pay you extra savings by reducing *controllable costs*. For our free 96-page systems analysis, *Graph-A-Matic Management Control*, write Systems Division, 315 Fourth Ave., N Y 10.

Remington Rand

THE FIRST NAME IN BUSINESS SYSTEMS

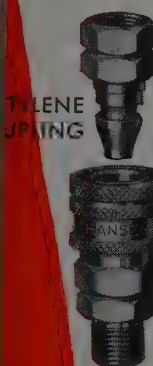
WITH AN EYE ON PRODUCTION *Costs* AND PRODUCTION *Volume*



AIR, OIL-
GREASE
COUPLING



OXYGEN
COUPLING



ACETYLENE
COUPLING

HANSEN COUPLINGS SAVE TIME...CUT COSTS

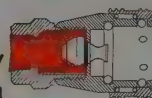
It's the minutes saved on operations repeated many times daily that mount up to substantial savings in time...and money. With Hansen Couplings, connections and change-overs become a matter of seconds with no hold-up of costly operations.

To connect a Hansen coupling, you merely push plug into socket. To disconnect, slide sleeve back with thumb. In both cases, flow is immediately and automatically turned on or off... with no time wasted, no losses.

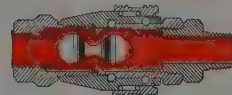
There is a specific Hansen coupling, made for air, oil or grease, for oxygen, and for acetylene. Available in a wide range of standard sizes.

Write for catalog describing full line of Hansen couplings and fittings for industrial use.

The Hansen
Two-Way,
Shut-Off
Coupling.



Red section shows how rubber washer in valve stem contacts valve seat in both plug and socket, sealing both plug and socket against leakage instantly.



Red section shows flow of liquid or gas around spool section of valve, permitting free flow of liquid or gas through coupling instantly upon connection.

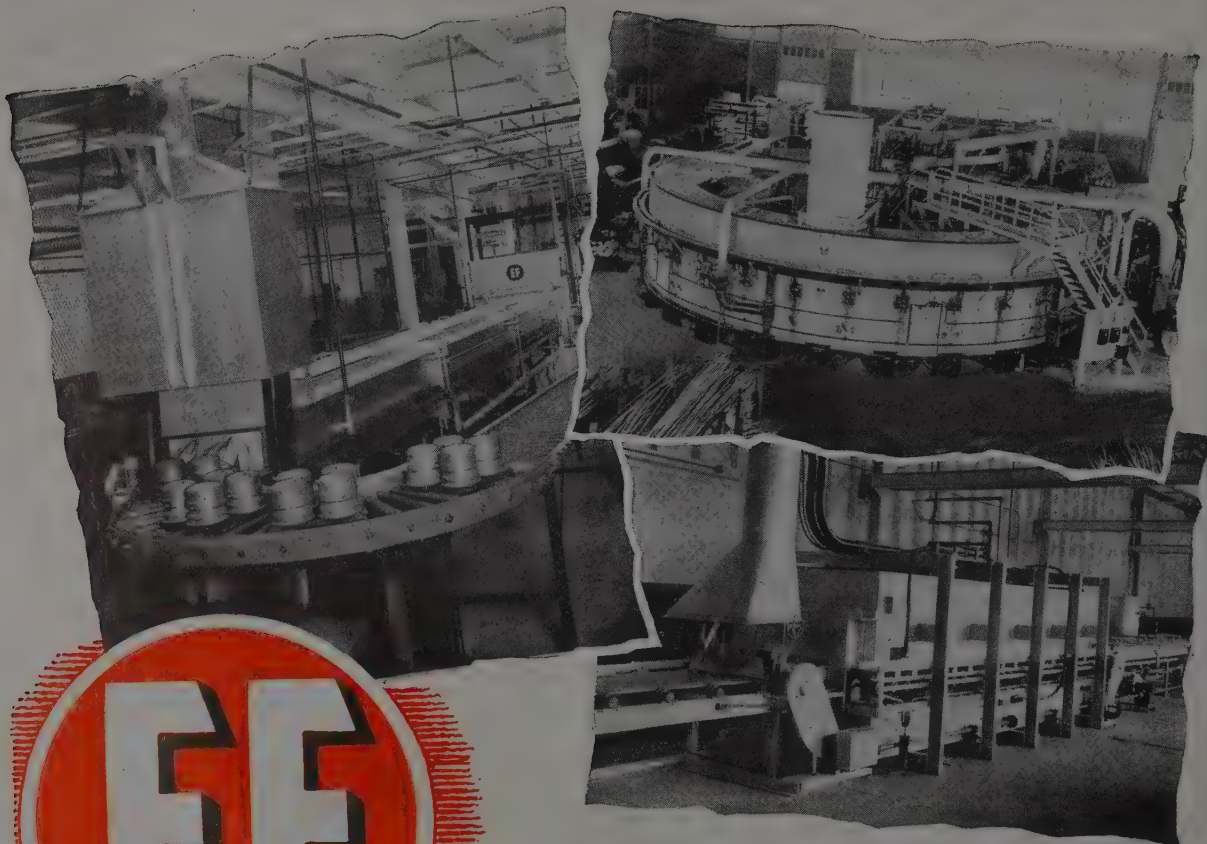
REPRESENTATIVES

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Eastern, Southern States:
B-R ENGRG. CO., Baltimore, Md.
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P. & W. URSEM CO., Cleveland, O.
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THE HANSEN MANUFACTURING CO.

36 EAST 27th STREET • CLEVELAND 14, OHIO



EF

GAS FIRED, OIL FIRED and ELECTRIC FURNACES **for any heat treating requirement**

● EF furnaces are built in many different types—suited for performing a wide variety of different heat treating processes. They are available in sizes to meet any capacity requirement, and reflect the advantage of the many service-proved features conceived and perfected by EF engineers, during the company's 30 years experience,—and available only in EF furnaces. These include the EF radiant tube, EF heat exchanger, EF alloy steel electric grids, EF roller design and mounting, EF atmosphere generators and many other devices that assure uniform temperature throughout the furnace—more accurate control of the heat within the required limits, low stack temperatures, increased outputs, reduced maintenance, and uniform, low cost, dependable operation.

Investigate the EF advantages—and let EF engineers, with their long and outstandingly successful record, work with you on your next heat treating job.



EF

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS—FACILITY OR PRODUCTION

Salem-Ohio

Great shakes for stubborn coal



Funny thing about coal. Send it on a train trip and it often gets stubborn about getting off the car.

Reason is that it settles during the trip—packs so tightly it won't flow out of the hoppers. Usually several men are needed to free the coal with sledges, pick axes and shovels.

This takes time—lots of it. It costs money! It ties up men, tools and cars . . . often a whole train, from engine to caboose. The same thing is true about unloading coke, ore, minerals and similar materials.

Couldn't something be done to break this bottleneck? Hewitt-Robins engineers set out to find a way. What they found is *great shakes for stubborn coal.*

It's the new Robins Car Shakeout, a giant shaker that shakes a car 1,000 times a minute.

It quickly loosens 50 to 70 tons of stubborn material . . . unloads a car "broom clean" often in as little as 90 seconds. Only two men are needed.

The whole job is done in minutes, not hours—without injury to men or hopper car.

The Robins Car Shakeout is only one in a long list of products "Job-Engineered" by Hewitt-Robins—including materials handling equipment and hose, belting, and other industrial rubber products. Together, Hewitt Rubber and Robins Conveyors bring you a total of 138 years of combined experience.

Want to learn the rest of the story? How Robins Car Shakeouts are unloading stubborn materials with minute-hand timing wherever rails go? Just write to the Robins Conveyors Division, Passaic, New Jersey. No obligation!



**HEWITT
ROBINS
INCORPORATED**

RUBBER DIVISION, BUFFALO 5, NEW YORK

CONVEYORS DIVISION, PASSAIC, NEW JERSEY

"Veeder-Readings"

ARE DIRECT READINGS

...THAT MINIMIZE
CONVERSIONS,
ERRORS, DELAYS

Here's a new idea that's catching on among users (*and builders*) of machine tools:

Put an end to the setting and reading of hairline-graduated dials on all types of machines.

Install a Veeder-Root Counting Device that will give direct and accurate *Control* over rate of feed, depth of cut, or any other phase of operation.

Then operators and inspectors get their Facts-in-Figures directly, plainly, *unmistakably* . . . in bold, easy-to-read figures that don't have to be converted, decoded, or otherwise translated.

Veeder-Root engineers will show you how frontline machine-tool builders are *now* using built-in Veeder-Root *Control* to save time and trouble for their customers and for themselves.

Just write and say when you would like to have a look at these interesting case-histories.



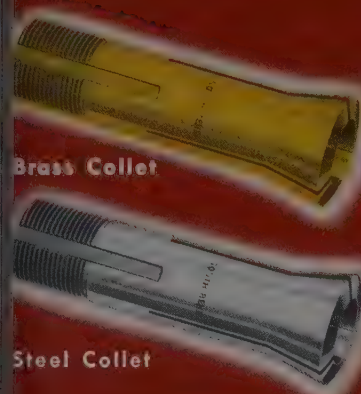
The Counting House of Industry

VEEDER-ROOT INC.

Hartford 2, Connecticut

In Canada: Veeder-Root of Canada, Ltd., 955 St. James St., Montreal 3. *In England:* Veeder-Root Ltd., Dickinson Works, 20 Purley Way, Croydon, Surrey.

16" x 6' South Bend
Precision Toolroom Lathe



Brass Collet

Steel Collet



Precision-built FOR PRECISION WORK

SOUTH BEND LATHES, because of their dependable precision, have long been favorites in toolrooms. For the same reason, plus extreme ease of operation, they are equally popular in manufacturing departments. Write for Catalog 100-F, which describes all sizes and types of South Bend Lathes.

SOUTH BEND COLLETS, manufactured with the same exacting care as South Bend Lathes, deliver long, dependable service on precision work.

STEEL COLLETS are carefully heat-treated for maximum service. Each collet is precision ground to exceedingly close tolerances, inspected and tested.

BRASS COLLETS, a South Bend innovation, have many practical applications. Their low cost makes them desirable for odd sizes that are used only occasionally. They can be readily machined on the job for holding tapered or irregular shapes. When worn, they can be re-bored to larger diameters.

WRITE for more complete information on South Bend Collets, Collet Attachments, and other lathe attachments.



COLLET BOX
Holds Handwheel Draw-in Collet Attachment and a set of 29 collets for 9-inch lathes.



COLLET RACK
Holds 19 collets, centers, spindle sleeve, draw-bar, spindle nose cap, wrench, etc.

SOUTH BEND LATHE WORKS



BUILDING BETTER LATHES SINCE 1906

429 E. MADISON ST., SOUTH BEND 22, IND.

SPECIFICATIONS OF SOUTH BEND BRASS AND STEEL COLLETS

Collet Number	For South Bend Lathes	A Thread Diameter Inches	B Thread Length Inches	C Threads Per Inch	D Body Diameter Inches	E Collet Length Inches	F Head Diameter Inches	G Angle of Head Degrees	Size Range	Prices f.o.b. factory	
										Brass Collets	Steel Collets
3	9" and Series 900	.650	3/4	26	.6495	2-11/16	.852	12	1/16"-1/2"	\$2.00	\$3.75
2	10" Regular and 13"	.855	13/16	20	.8595	3-5/16	1.095	15	1/16"-11/16"	2.25	4.00
5	10"—1 Collet, Series 1000, 16", and 16-24"	1.250	3/4	20	1.2495	3-9/32	1.452	10	1/16"-1"	2.50	4.75
4	14-1/2"	.950	13/16	20	.9495	3	1.150	10	1/16"-3/4"	2.35	4.25

* Collets can also be used on any other lathe or machine which they will fit.

* Collets are supplied for round work in increments of 1/64". Metric and decimal collets are supplied to order at slightly higher prices.

WAKE SLEEPING SCRAP !

Put this giant to work at once, making STEEL

THE millions of tons of dormant scrap, lying idle in shops all over America, are critically needed for the making of new steel. If the mills run short of scrap, YOU must do with less steel. It is YOUR SLEEPING SCRAP they need. Don't slow down your effort to find it and turn it in.



YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

GENERAL OFFICES YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

CARBON - ALLOY AND VOOLOY STEELS

Pipe and Tubular Products-Sheets-Plates-Conduit-Bars-
Rods-Wire-Electrolytic Tin Plate-Coke Tin Plate-Cold
Drawn Carbon Steel Rounds-Tie Plates and Spikes

"with **GULF L. S. CUTTING BASE**

we doubled tap life,
reduced breakage, and
improved thread finish"

says this Lubrication Supervisor



WE make careful performance studies to insure that the cutting oil used for each particular job is the best we can select for that job," says this Lubrication Supervisor. "This policy has paid us big dividends in greater machining efficiency. When we switched to Gulf L. S. Cutting Base for tapping magnet yokes, for example, we increased tap life 100 per cent, reduced tap breakage, and improved thread finish."

The Lubrication Supervisor consults with a Gulf Lubrication Engineer (left) on results with Gulf L. S. Cutting Base A in tapping cold rolled iron magnet yokes for business machines.

Every Gulf Cutting Oil has specific properties which insure better performance on certain types of jobs! Call in a Gulf Lubrication Engineer today and let him show you how they can help you improve your machining practice. Write, wire, or phone your nearest Gulf office.

Gulf Quality Cutting Oils

Gulf Lasupar Cutting Oils A, B, and C
Gulf Electro Cutting Oils A, B, and C
Gulf M-L Cutting Oils A, B, and C
Gulf Cut-Aid
Gulf Cutx B
Gulf L. S. Cutting Base A and B
Gulf Soluble Cutting Oil A



Gulf Oil Corporation • Gulf Refining Company

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta
New Orleans • Houston • Louisville • Toledo

MULTIPLE

Fastener Protection

PLUS ASSEMBLY LINE ECONOMIES

AT THESE POINTS:

- 1—Body-Hold-Down
- 2—Gas Tank Strap
- 3—Accelerator Treadle Hinge
- 4—Hood Operating Arm
- 5—Radiator Brace Rod
- 6—Glove Box Check Arm



WILLYS-OVERLAND 'JEEP' STATION WAGON

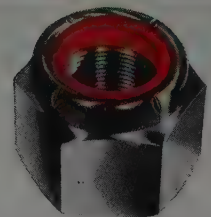
—with the Self-Locking, Self-Sealing and Reusable Red Elastic Collar

Willys-Overland's new 'JEEP' Station Wagon has a world-wide reputation for stamina, performance and economy. So here again, self-locking ESNA Elastic Stop Nuts have been applied at six tough detachable fastener assembly points to lock out body squeaks and rattles... maintain alignments... permit easy removal and replacement for servicing. And further, to reduce assembly line costs with a one-piece, self-locking fastener that can be quickly run-on with a power tool.

All ESNA Elastic Stop Nuts—with the self-locking, self-sealing and reusable Red

Elastic Collar—provide dependable protection against Vibration, Impact and Stress Reversal in both prestressed and positioned settings.

In addition, they protect against Thread Corrosion, Thread Failure and Liquid Seepage. This multiple protection helps achieve the double economy of inventory simplification and reduced procurement costs. ESNA engineers are ready to study your fastener problems. Address: Elastic Stop Nut Corporation of America, Union, New Jersey. Sales Engineers and Distributors are conveniently located in many principal cities.



LOOK FOR THE RED COLLAR THE SYMBOL OF SECURITY.

It is threadless and dependably elastic. Every bolt—regardless of commercial tolerances—impresses (does not cut) its full thread contact in the Red Elastic Collar to fully grip the bolt threads. In addition, this threading action properly seats the metal threads—and eliminates all axial play between bolt and nut.

All ESNA Elastic Stop Nuts—regardless of size or type—lock in position anywhere on a bolt or stud. Vibration, impact or stress reversal cannot disturb prestressed or positioned settings.



ELASTIC STOP NUTS



INTERNAL
WRENCHING



ANCHOR



WING



SPLINE



CLINCH



GANG
CHANNEL



PRODUCTS OF: ELASTIC STOP NUT CORPORATION OF AMERICA

Now- THE No. 2 MOTCH & MERRYWEATHER CIRCULAR SAWING MACHINE

STILL FURTHER EXTENDS THE
ADVANTAGES OF THE

(Up to 6" Stock)
—22" Blade

*Triple-
Chip*
METHOD

No. 2 Circular Sawing Machine

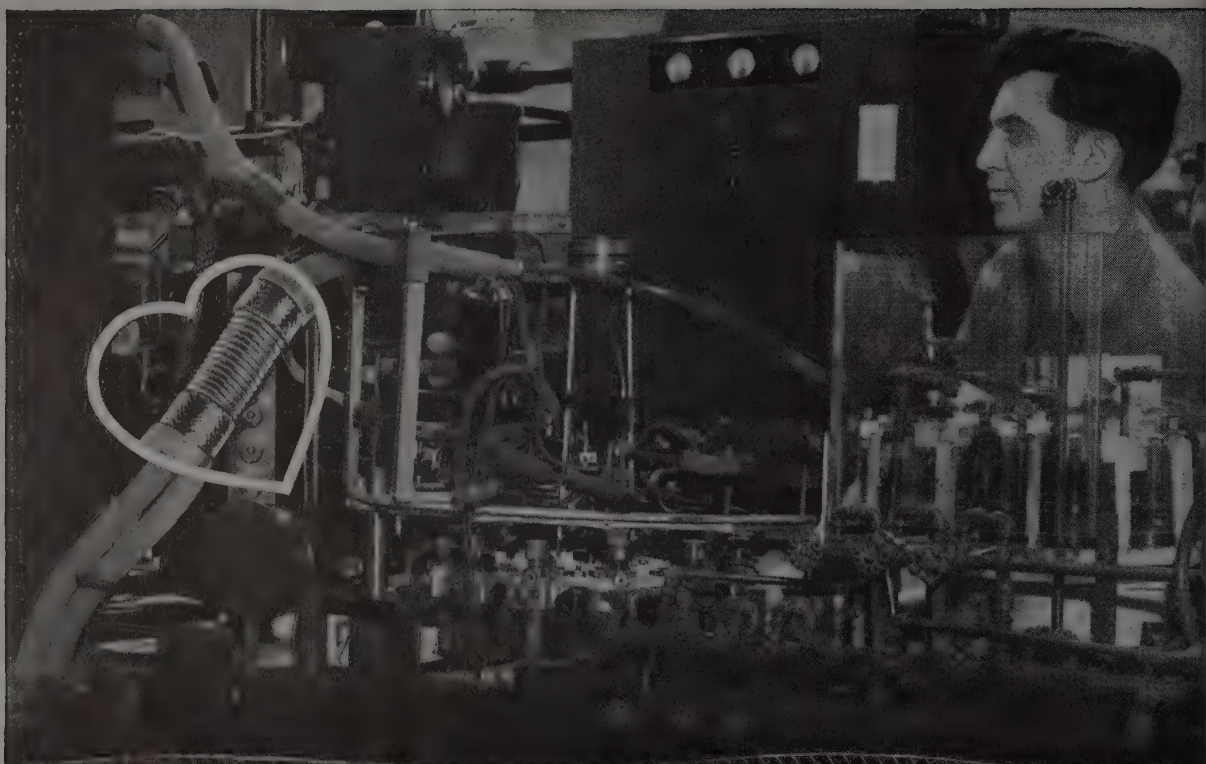
FULL AUTOMATIC (Shown Here) OR MANUAL MODEL

In the No. 2 Motch & Merryweather Circular Sawing Machine you find all the advantages of the Triple-Chip Method, together with features exclusive to this Model. You get positive hydraulic clamping on both sides of the saw blade; sufficient feeds and speeds for cutting off all kinds of material; a stock stop built into the automatic feeder to give quick adjustment and increased accuracy; controls grouped on a convenient panel. Also, all Triple-Chip advantages: high production, lengths accurate and uniform, burrless ends, practically no maintenance, long service.

Ask for our
well illustrated
Bulletin "M".

Only
M&M builds
ALL 3:
COLD SAW
SAW BLADE
BLADE GRINDER

THE MOTCH & MERRYWEATHER MACHINERY CO.
PENTON BUILDING
CLEVELAND 13, OHIO



COOLING OFF A "HOT SHOT"

Penflex "Flexineering" solves problem of conducting and cooling a 3500-volt "shot" in vacuum tube plant.

One well-known vacuum tube manufacturer developed several powerful induction heat "bombarders" for forming the vacuum in radio tubes. A 3500-volt "shot" quickly generates 950°F. in the tubes . . . exhausts the air . . . forms a vacuum, speedily, efficiently.

But—a problem arose. They needed a good conductor to carry the "hot shot" to the machine head—one that could be kept cool, yet remain flexible. Various wiring arrangements and cooling devices were tried but each proved impractical. Then Penflexweld tubing was applied and—the problem vanished!

The copper construction of Penflexweld furnishes an ideal conductor, while cold water circulating

through the tubing keeps it cool. Penflexweld flexes easily with constant machine motion. Wrapped rubber insulation protects operators from shock. The highest efficiency developed by the use of Penflexweld eliminated the need for larger and more expensive bombarder units.

Penflex "Flexineering" (the science of engineering each type of flexible metallic tubing to the particular problem) can help solve similar problems on production, maintenance, and product design in your plant. For helpful engineering service and a complete line of metallic hose and tubing from $\frac{1}{8}$ " I.D. to 30" I.D. in all types . . . for all uses . . . call on Penflex. Write today for additional data on the above case history.

PENFLEX SALES COMPANY

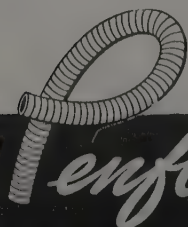
Division of

PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY

7219 Powers Lane

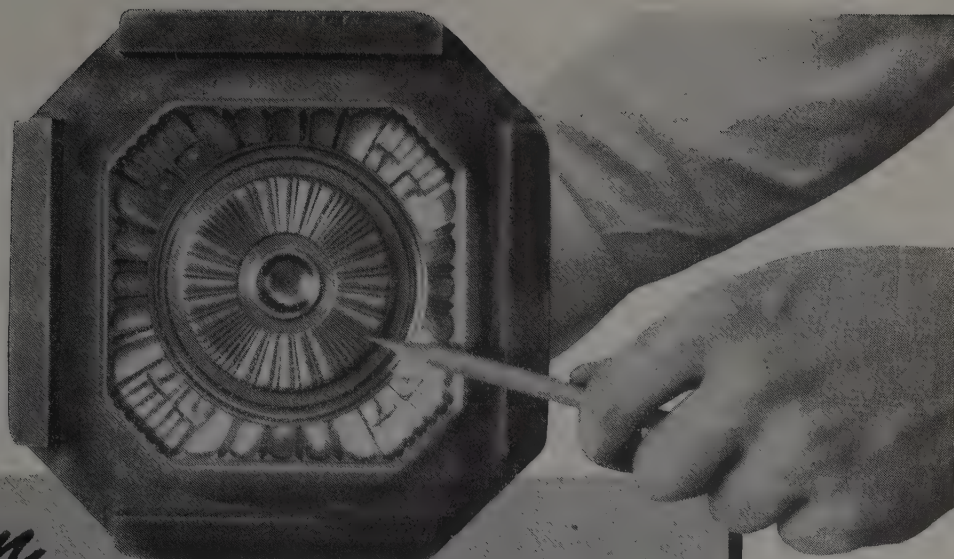
Philadelphia 42, Pa.

BRANCH SALES OFFICES—BOSTON • NEW YORK • SYRACUSE • CLEVELAND • CHICAGO • HOUSTON • LOS ANGELES



Penflex... HEART OF INDUSTRY'S LIFE LINES

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When
MACHINABILITY
Comes First...

IT PAYS TO USE
Chateaugay
PIG IRON

Take this intricately machined lamp base mold, for example. It's made of Republic CHATEAUGAY Pig iron. The reason is that still another foundry has learned from actual experience that there's no better or more economical means for insuring flaw-free, easy-to-machine casting surfaces.

When made with CHATEAUGAY Pig Iron, it makes no difference how large or how small the casting. It can be milled, drilled, turned or otherwise machined quickly, easily and economically.

Actually, CHATEAUGAY is a low-phosphorous,

copper-free pig iron which consistently out-performs other pig irons. It flows smoothly, sets rapidly and cools evenly, and its highly uniform distribution of chemical elements means a dense, fine grain structure in *all* castings, regardless of size or shape.

Why not let a Republic Pig Iron Metallurgist give you the complete story about CHATEAUGAY at your convenience? Just let us know when you would like him to call.

REPUBLIC STEEL CORPORATION
 GENERAL OFFICES: CLEVELAND 1, OHIO
 Export Department: Chrysler Building, New York 17, New York



Republic **PIG IRON**

"CHATEAUGAY"
 Low-Phosphorus,
 Copper-Free

"REPUBLIC"
 (Northern)
 Foundry, Basic
 and Malleable

"PIONEER"
 (Southern)
 Foundry and Basic



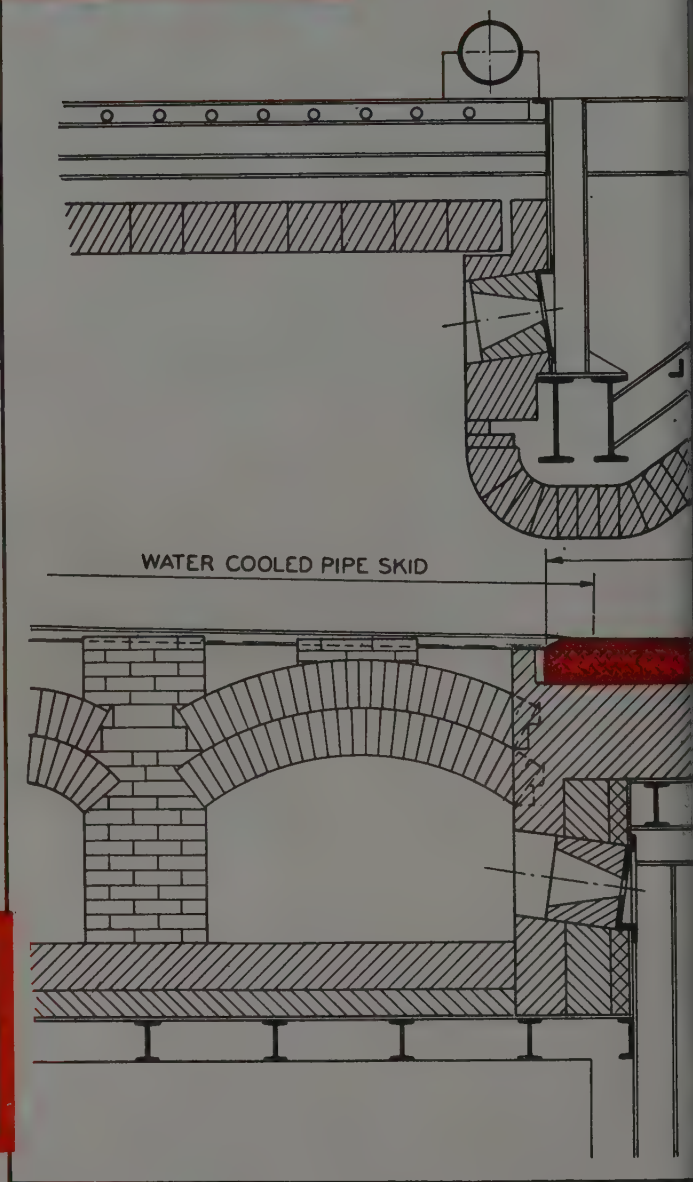
ALSO TRUSCON FOUNDRY FLASKS • REPUBLIC CORE WIRE • FOUNDRY NAILS

MAINTENANCE COSTS SLASHED

120,000 tons of Billets heated with **No** **Repairs to** **CARBOFRAX** **Skid Rails**

DETAILS OF OPERATION

Unit	12" mill furnace.
Operation	Heating alloy and stainless steel billets.
Stock	2 $\frac{3}{4}$ " - 5 $\frac{1}{2}$ " squares, 50" - 90" long.
Temperature	1900°F. - 2275°F.



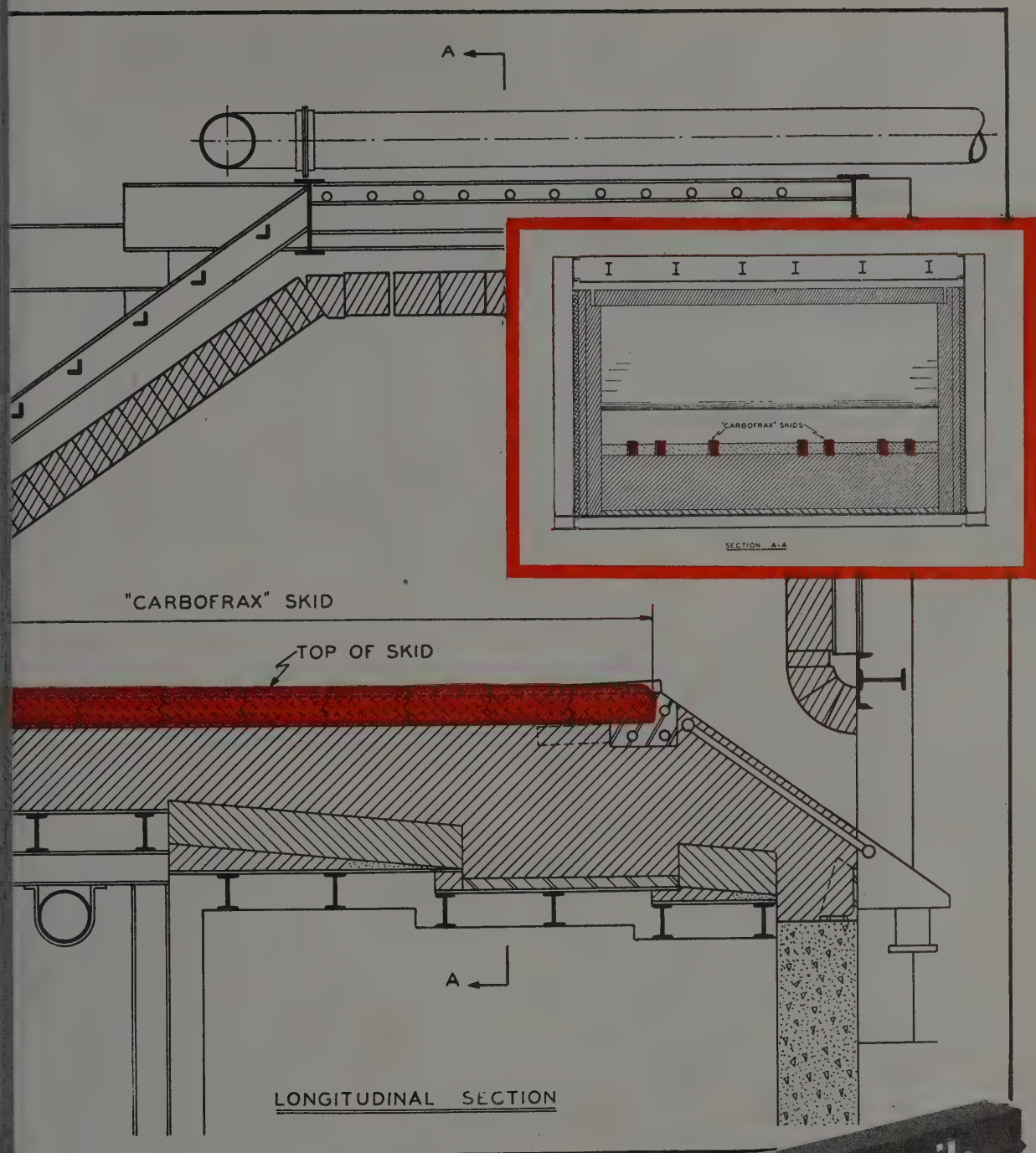
120,000 tons of billets were pushed over CARBOFRAX silicon carbide skid rails in this furnace. In service eighteen months, no repairs to skids have been required. Original alignment is maintained. Rails show less than 1" wear. Excellent abrasion resistance and load carrying characteristics of CARBOFRAX skids at elevated temperatures made this performance possible.

Previously equipped with alloy skids, rail repairs were essential every six weeks. This work, done during weekend shutdowns, was at high labor rates. Reason enough in itself why operators switched to CARBOFRAX rails.

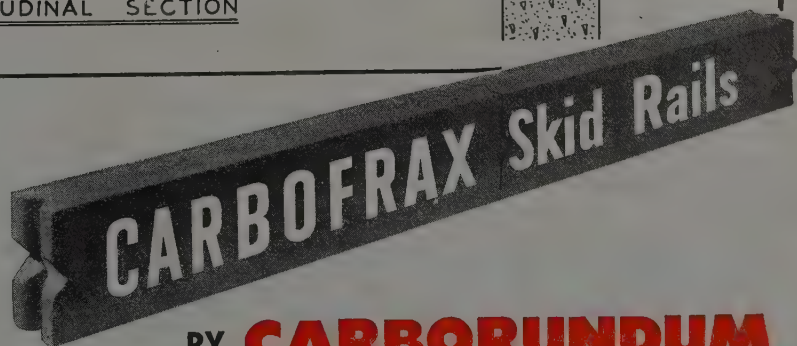
In addition, other striking savings resulted. Over four times the installed cost of CARBOFRAX rails

has been saved by eliminating frequent skid maintenance. Furnace repair charges per ton of steel rolled have been slashed. Finished steel costs have dropped. Freedom from skid buckling has facilitated furnace operation.

Invariably providing distinct savings, CARBOFRAX rails are applicable to many different types of



heating furnaces. Call in our engineers to discuss the possibilities of using these skids in your units. Their broad engineering experience can provide valuable assistance in answering specific operating problems. Write Dept. J-57 for a copy of the bulletin "Carbofrax Refractory Skid Rails," The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.



BY **CARBORUNDUM**

TRADE MARK



"Carborundum" and "Carbofrax" are registered trademarks which indicate manufacture by The Carborundum Company

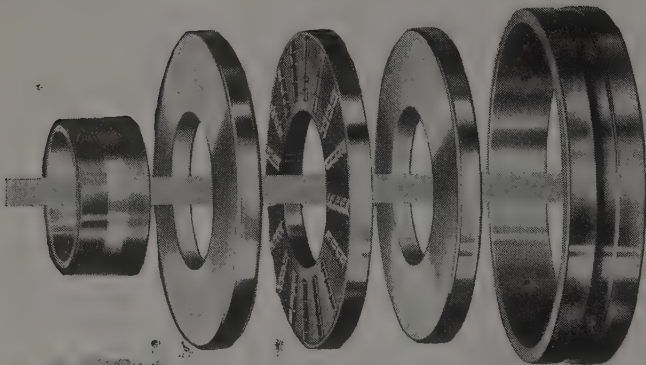
SPLIT YOUR LOAD IN TWO !

with

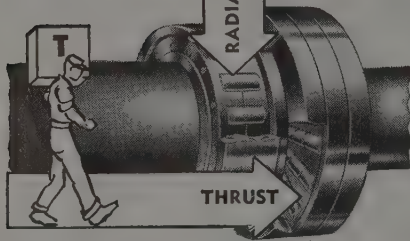
ROLLWAY

RIGHT-ANGLE-LOADED

BEARINGS



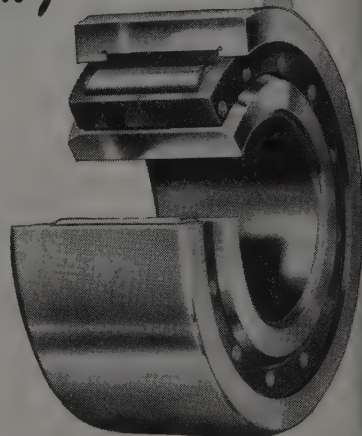
Right-Angle Loading splits compound loads into the two component parts of pure radial and pure thrust... and carries each of these components on separate bearing assemblies. Simple but scientifically sound.



1. Keeps bearings free of complicated stresses
2. Gives longer bearing life with higher capacity
3. Cuts maintenance cost and lay-up time

What Right-Angle-Loading Does!

1. Prevents wedging of rollers and pinch-out. Reduces roller end-rub, with its wearing friction. Holds starting and operating torque at a minimum.
2. Since only pure radial or pure thrust loads can be imposed upon any single bearing assembly, unit pressures are reduced substantially.
3. Since all loads are carried at right-angles to the roller surface, compound or oblique loads are avoided and so are the resultants of the oblique loads.
4. Right-angle loading permits greater radial or thrust load-carrying capacity in any given dimension.
5. Right-angle loading assures solid cylindrical rollers of greater roller mass and uniform roller cross-section... greater resistance to shock loads and vibration... longer life expectancy under continuous heavy-duty service.



Free Service!

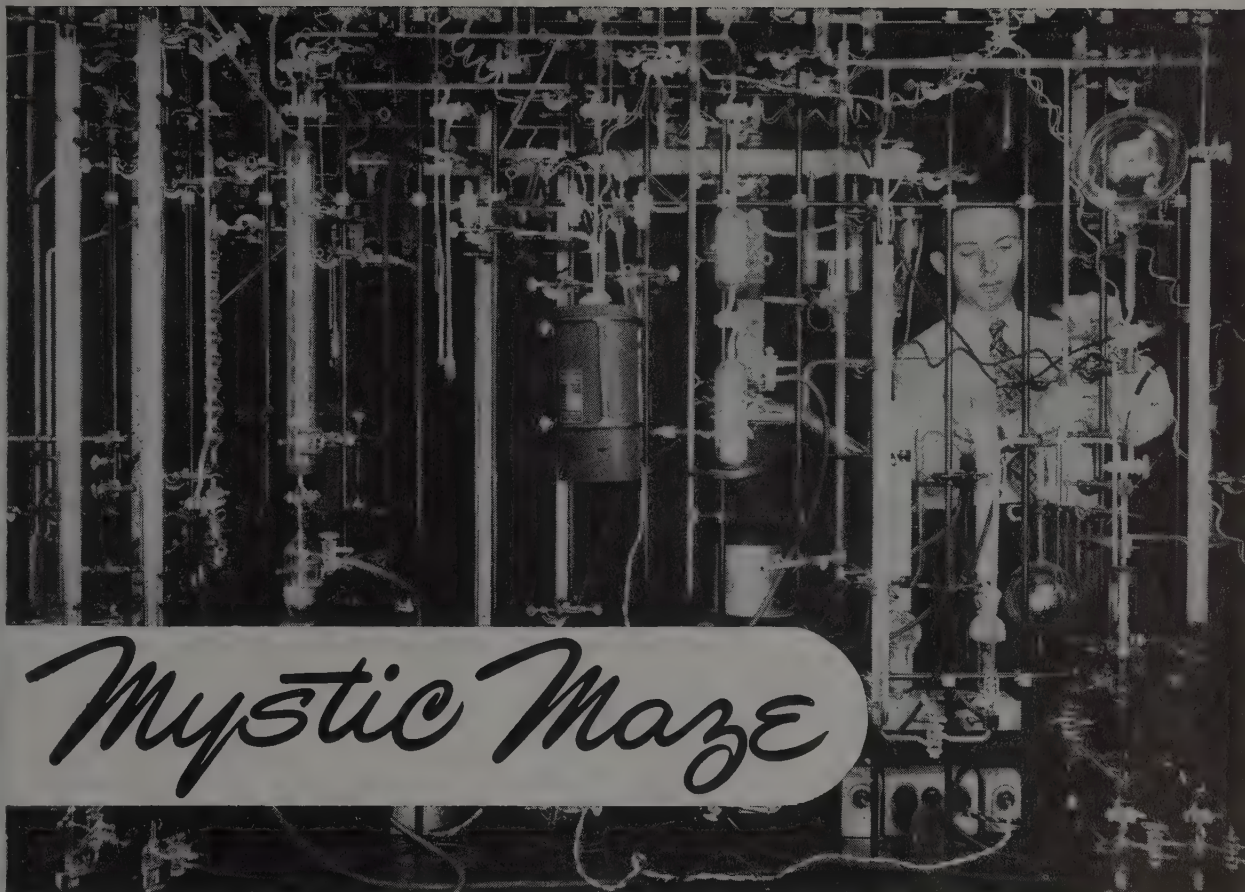
Select the **RIGHT** bearings for **YOUR** particular needs...

Rollway engineers will gladly make necessary calculations, drawings and supply other required information for a complete understanding of your bearing problem. No charge.

ROLLWAY BEARINGS

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

SALES OFFICES: Philadelphia • Boston • Pittsburgh • Cleveland • Detroit • Chicago • Minneapolis • Houston • Los Angeles



(Isotherm Adsorption Apparatus)

Mystic Maze

Seen through this mystic maze of tubes and wiring is a Sinclair Research technician. What his apparatus means to users of industrial lubricants is no mystery, however.

At Sinclair Laboratories, the Isotherm Adsorption Apparatus is used constantly to determine the effectiveness of adsorbents used in lubricating oil refining procedures. Because Sinclair lubricants are made with infinite care to suit the specific requirements of your equipment, it is highly important to know exactly how adsorbents, catalysts, and other treating materials perform in a refining process.

This intricate apparatus is an assurance that Sinclair lubricant manufacture guarantees the very highest quality product. It is one more evidence of the painstaking Sinclair research and refinery control that result in outstanding lubricant performance.

Sinclair Metal Working Oils

SUPER-WILKUT

an all-around cutting oil

For any metal — any automatic

Non staining • non corrosive
even on non-ferrous metals

SINCLAIR REFINING COMPANY • 630 FIFTH AVENUE, NEW YORK 20, N. Y.

SINCLAIR

Lubricants for Industry

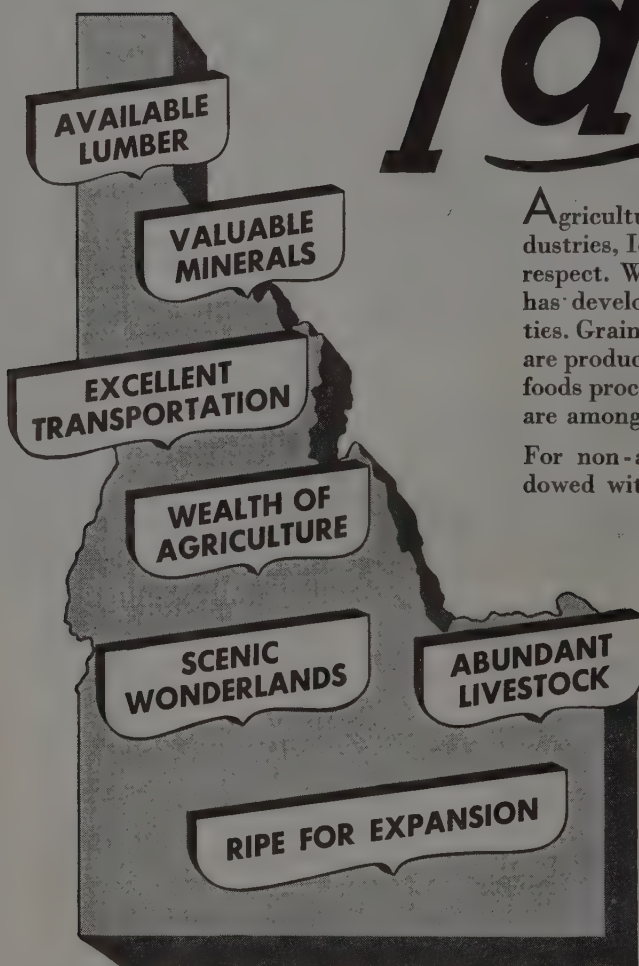
FINEST CRUDES + EXPERT RESEARCH

and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE



TREASURE MAP OF INDUSTRY

Idaho*



Agriculture being the life-blood of many industries, Idaho is particularly fortunate in that respect. World-famous for the Idaho potato, it has developed many other agricultural activities. Grains, vegetables, fruit... cattle and sheep are produced in abundance. Dehydration, frozen foods processing, dairying, canning and packing are among the state's flourishing industries.

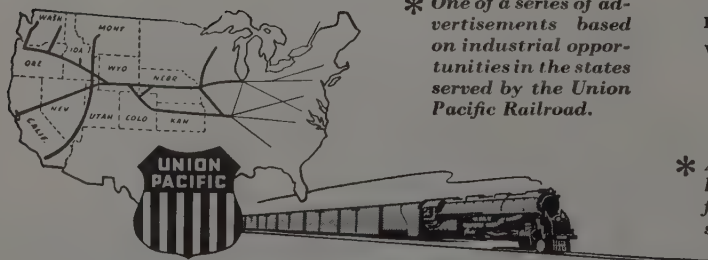
For non-agricultural industries, Idaho is endowed with rich veins of minerals. Numerous manufacturers of stone, clay and glass products have established plants in Idaho. Lumber for building and wood products is available. Unsurpassed rail transportation is provided by Union Pacific.

As a vacation region, Idaho has a wonder-world of its own in Sun Valley... year-'round sports center... the world famous primitive area... and in the scenic surroundings of Payette Lake.

Idaho is a young thriving state, ripe for further industrial development. It offers good living and working conditions, good schools, splendid cultural advantages... and its energetic citizens assure newcomers of a true western welcome.

* One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.

* Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.



UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

EATON PERMANENT MOLD GRAY IRON CASTINGS

for Trucks and Buses

Eaton Permanent Mold Gray Iron Castings possess ideal characteristics for heavy duty automotive service. High tensile strength, uniform structure throughout the casting, freedom from growth, and ability to take a high surface finish recommend them for a wide range of uses.

In hydraulic applications where freedom from leakage under pressure is critically important, the dense, non-porous structure of Eaton Permanent Mold Gray Iron Castings is a decided advantage.

Free machinability, a quality of all Eaton Permanent Mold Gray Iron Castings, makes for machining speed and production economy.

Eaton Foundry Division engineers will be glad to discuss the application of Eaton Permanent Mold Gray Iron Castings to your product. Send for your copy of the illustrated booklet, *"A Quick Picture of the Eaton Permanent Mold Process for producing Gray Iron Castings."*



© 1947, EATON MFG. CO.



THE EATON PERMANENT MOLD MACHINE IS A SYMBOL
OF THE QUALITY OF GRAY IRON CASTINGS PRODUCED
BY THE PERMANENT MOLD PROCESS

EATON

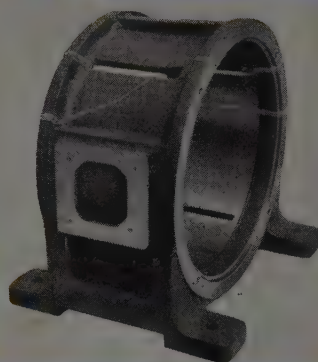
MANUFACTURING COMPANY

FOUNDRY DIVISION

9771 French Road

Detroit 13, Michigan

P & H
"NICAST"



A NEW P&H ELECTRODE

FOR EASIER, *fully-machinable* CAST IRON WELDS

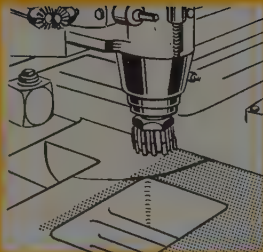
"Nicast"—newest P&H Electrode development—puts cast iron in a class with steel for ease of welding and finishing. It's a new type cast iron electrode that leaves nothing to be desired. It possesses every desired characteristic for simpler, surer cast iron welding.

"Nicast" welds are strong and non-porous and fully machinable in both the weld and fusion zone areas. Deposits can be drilled, tapped, milled or machined—in any manner, shape or form. "Nicast" is an all-position electrode for AC

or DC. Elaborate procedures and preparations are eliminated because most applications require no preheating or post-heating. What's more, "Nicast" gives you welds that will withstand hydrostatic pressure.

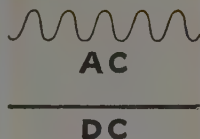
Use P&H "Nicast" for all cast iron repair-welding and for welding cast iron to steel. It's the electrode you have been waiting for to simplify all cast iron welding—to make this welding easier and faster.

Your P&H representative has "Nicast" now. Call him or write for information.

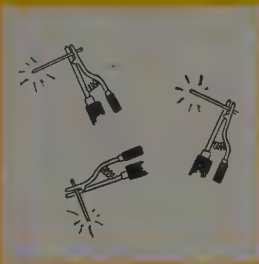


FULLY MACHINABLE welds are yours when you use "Nicast". It gives you weld deposits that match closely the color of cast iron.

IT'S
"NICAST"
FOR
MACHINABLE
CAST IRON
WELDING



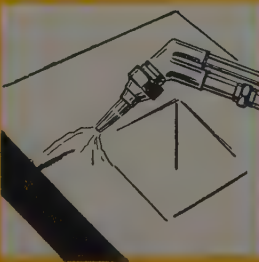
AC OR DC, whichever your machine, you can use "Nicast" for sound, easy welds on cast iron. And "Nicast" is available in the two preferred sizes — 1/8" and 5/32" by 14".



ALL POSITION WELDING. Lay in fast, easy welds in any position with "Nicast" — flat, vertical, overhead or horizontal.



LOW AMPERAGE. "Nicast" was designed for use in the low heat range. It puts an end to the old troubles characteristic of electrodes too "hot."



LESS PREPARATION. Another important feature of "Nicast". Most applications require no time-taking preheating or post-heating. Welding is simpler, faster.

CALL ON P&H FOR ALL ELECTRODE REQUIREMENTS



"AW-28"	"AW-4"	"CN-50"	"DN-2"	"FW"	"AC-3"	"FK"	"AD-1"	"AP"
AWS E-10020	AWS E-10012	AWS E-7011	AWS E-6020		AWS E-6013	AWS E-6012	AWS E-6011	AWS E-6010

There is a P&H Electrode in the correct type and size for all mild steel applications as well as for welding stainless and alloy steels and for hard surfacing. Above are shown a few of the complete mild steel group.

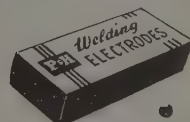
AMERICA'S MOST COMPLETE ARC WELDING SERVICE



DC
WELDERS



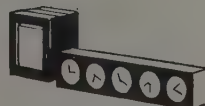
AC
WELDERS



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ELECTRODES



WELDING
POSITIONERS



WELDING PRODUCTION
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ELECTRIC
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HARNISCHFEGER

CORPORATION

WELDING ELECTRODES

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WELDING ELECTRODES - MOTORS - HOISTS
ELECTRIC CRANES - ARC WELDERS - EXCAVATORS

For Better Metal Degreasing— Du Pont Solvents



NOW Du Pont has developed a new and improved Trichlorethylene which is **BETTER THAN EVER**. This product and Perchlorethylene are two fine solvents. They are the best Vapor Degreasing solvents we've ever made—the best we know how to make. Use them with complete confidence and assurance for all metal degreasing work. We believe they'll serve you *better!*

UNDER VARIOUS TRADE NAMES, Du Pont Trichlorethylene and Perchlorethylene solvents for metal cleaning have served American industry successfully for many years. If you have used vapor degreasing solvents in your plant, no doubt you have used these solvents made by Du Pont.



LOOK TO the service offered by Du Pont and by distributors of Du Pont solvents to help you conserve your solvents through effective and economic operation. Send *today* for your copy of "Metal Degreasing—Standard Practice." E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

DU PONT SOLVENTS
for VAPOR DEGREASING

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

**SOLD NATIONALLY
THROUGH DISTRIBUTORS**

DU PONT



EFFICIENT WAY TO MOP UP

Another top performance by a **BWH** product

Draining excavations, quarries and mines is hard on hose . . . even the wire-reinforced suction hose used with centrifugal or diaphragm pumps.

The hose must be able to withstand high vacuum and bending into extreme arcs. But the greatest hazards are falling timbers and carelessly driven trucks.

When truck wheels displaced the wires on a western contractor's equipment, his hose collapsed under suction. The contractor brought his problem to BWH . . . asked for hose that offered real resistance to crushing.

Our engineers recommended performance-tested Leader Smooth Bore Suction Hose. It has a closely spaced, inner spiral round wire of galvanized high tensile spring steel built within the wall. Numerous plies of quality duck, ingeniously applied to anchor the wire firmly in place, form the carcass. The cover is of tough wear-resistant rubber. The resiliency of the wire and the general construction of the hose makes it highly flexible as well as crush-resistant.

The contractor now reports that this BWH hose has taken long, severe service. It has far outlasted his original hose of

light, widely spaced, low tensile wire and light fabric.

Leader Water Suction Hose, also available in Rough Bore, is just one of the many quality products manufactured by BWH. Whatever your need for industrial rubber goods, look to BWH for dependable ruggedness . . . BWH distributors for dependable service.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearby BWH distributor, or write direct.

Another quality product of

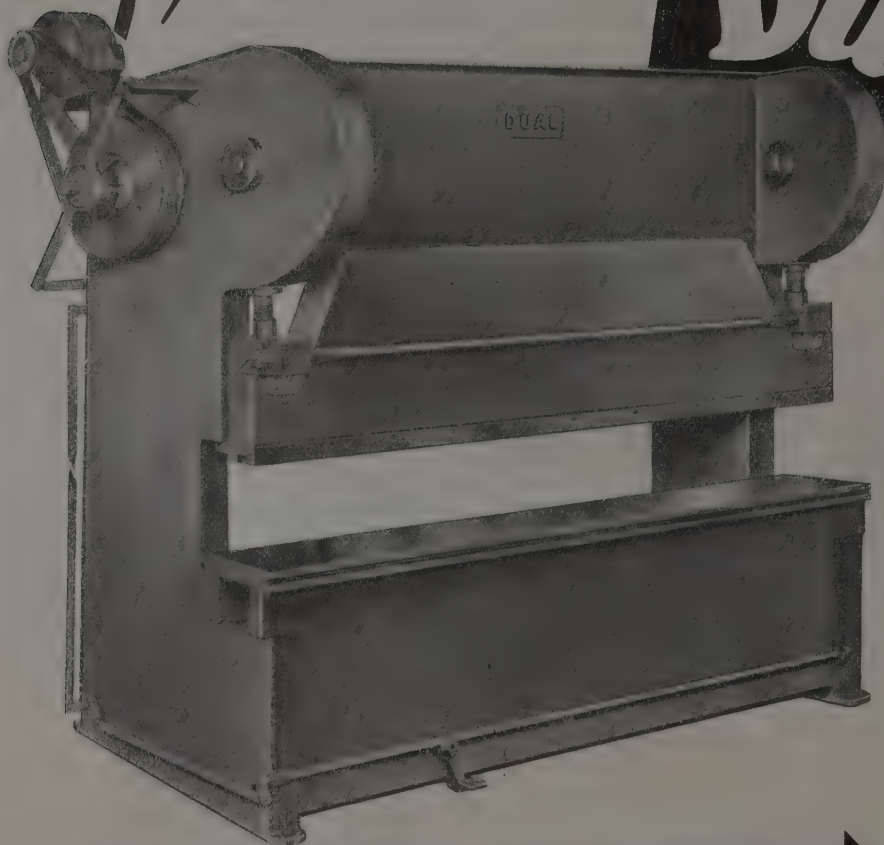
BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all principal cities

WORKS: CAMBRIDGE, MASS., U.S.A. • P. O. BOX 508, 1921, BOSTON 3, MASS.

Proven Performance!

Dual



**The All-Steel
Press Brake Has
Proven That It
Could "Take It!"**

THE DUAL BOLSTER MAKES IT IDEAL FOR MANY JOBS!



**Let us Help You
Solve your
Production Problems!
Consult our Capable
Staff of Engineers!**

Dependable performance on every job it undertakes... that's your proof positive that the Dual All Steel press brake will increase the efficiency of your plant! It does bending, forming, blanking and multiple punching... thanks to the versatile construction of the 2-way Dual bolster! Ready for instant use on varied jobs.

Manufactured in six series and 30 different sizes with capacities ranging from 5 feet of 16 gauge to 20 feet of ½ inch steel plate.

*Write for Illustrated
Booklet Today!*

Dual

P R E S S C O M P A N Y
2812 IOWA AVENUE . . . ST. LOUIS 18, MO.



When America rode the "Drasina"... "STANDARD" was old enough to vote

When this grandfather of the bicycle was introduced to America, its only rival in the field of personal transportation was the horse; even the first railroad was still some years away. First termed the "Drasina" for its inventor, a Baron Carl von Drais, it was later called "pedestrian curricule," "hobby horse," and—for its American appearance—"velocipede."

It is over a century and a quarter since gay young blades scorched along New York, Boston and Philadelphia streets on this mechanical marvel . . . yet even then "Standard" was an established metal producer, had a furnace with a stack 20 feet high and a bosh 7 feet in diameter, and was turning out from 12 to 15 tons of blooms and bar iron a week.

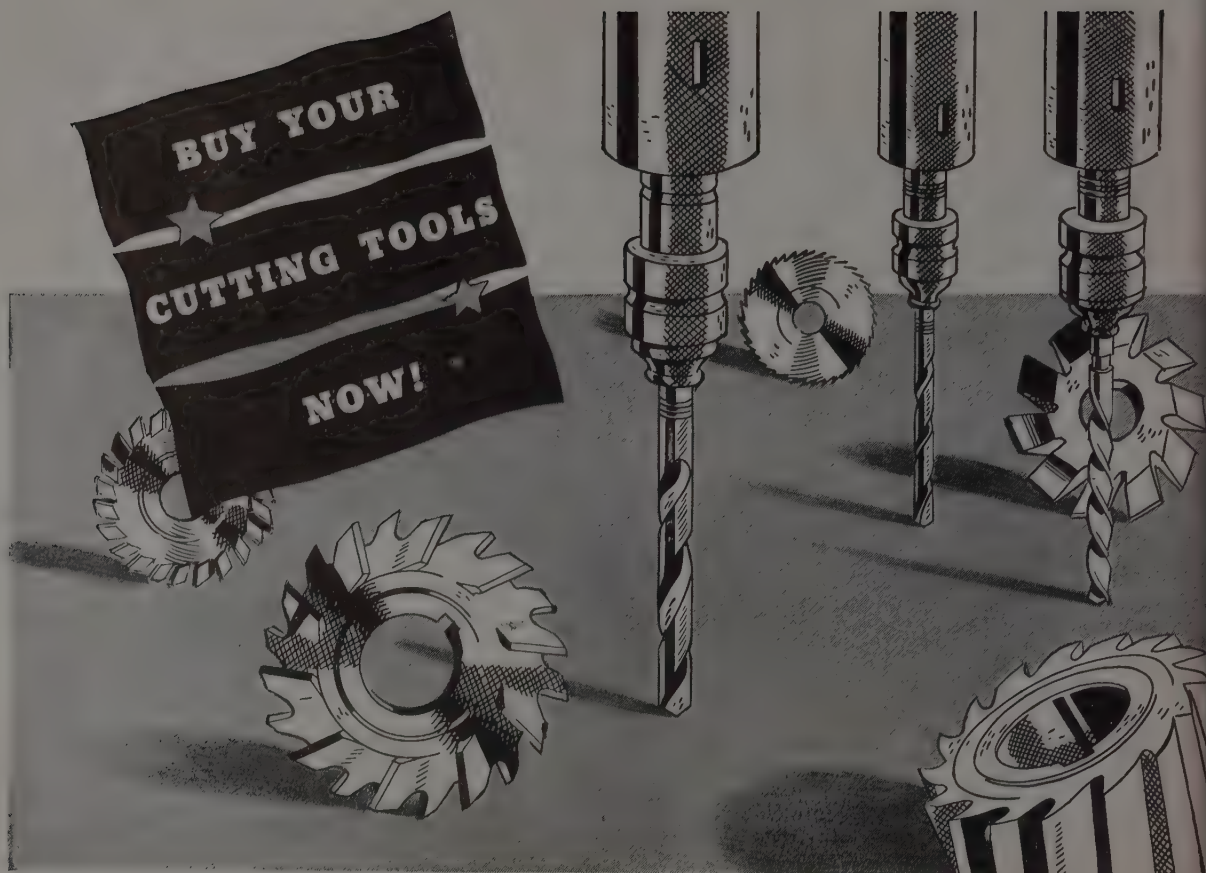
The intervening changes in transportation are paralleled by the changes in Standard service. Today

Standard's five open hearth furnaces have a capacity of 160,000 net tons. Through control of all operations from melting to final shipping, Standard maintains the quality standards that guarantee users of quality products. To simplify *your* supply problems on forgings and castings, "Standardize on Standard." The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U. S. A. Offices: Philadelphia, New York, Chicago, St. Louis, Washington, Boston, San Francisco, Cleveland, Detroit, Pittsburgh, Houston, Birmingham, Norfolk, Seattle.



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1120

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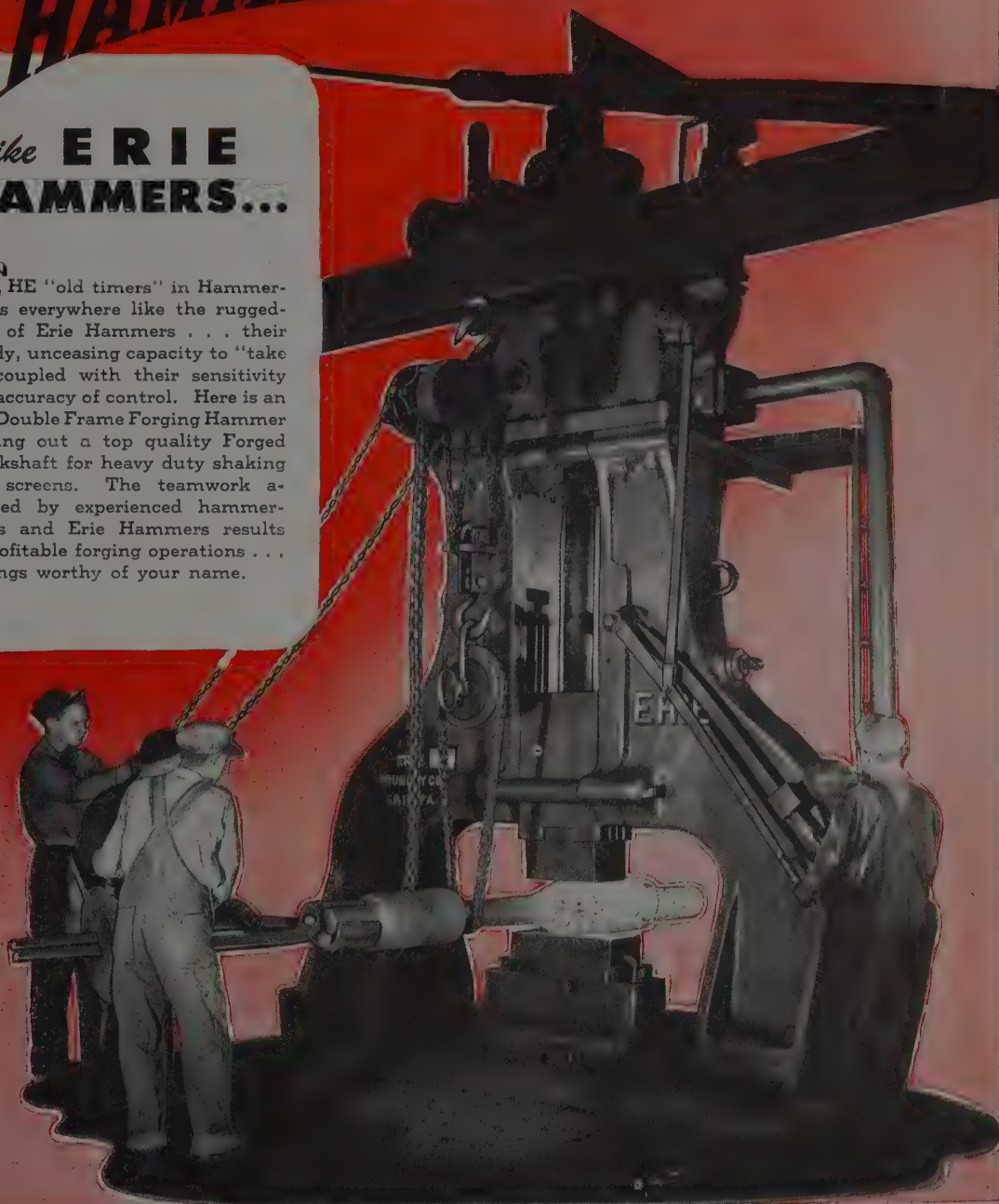


Photo courtesy of The McNally-Pittsburg Mfg.
Corp., Pittsburg, Kansas

ERIE

Write for bulletin 345 with full details on Erie Double Frame Forging Hammers.

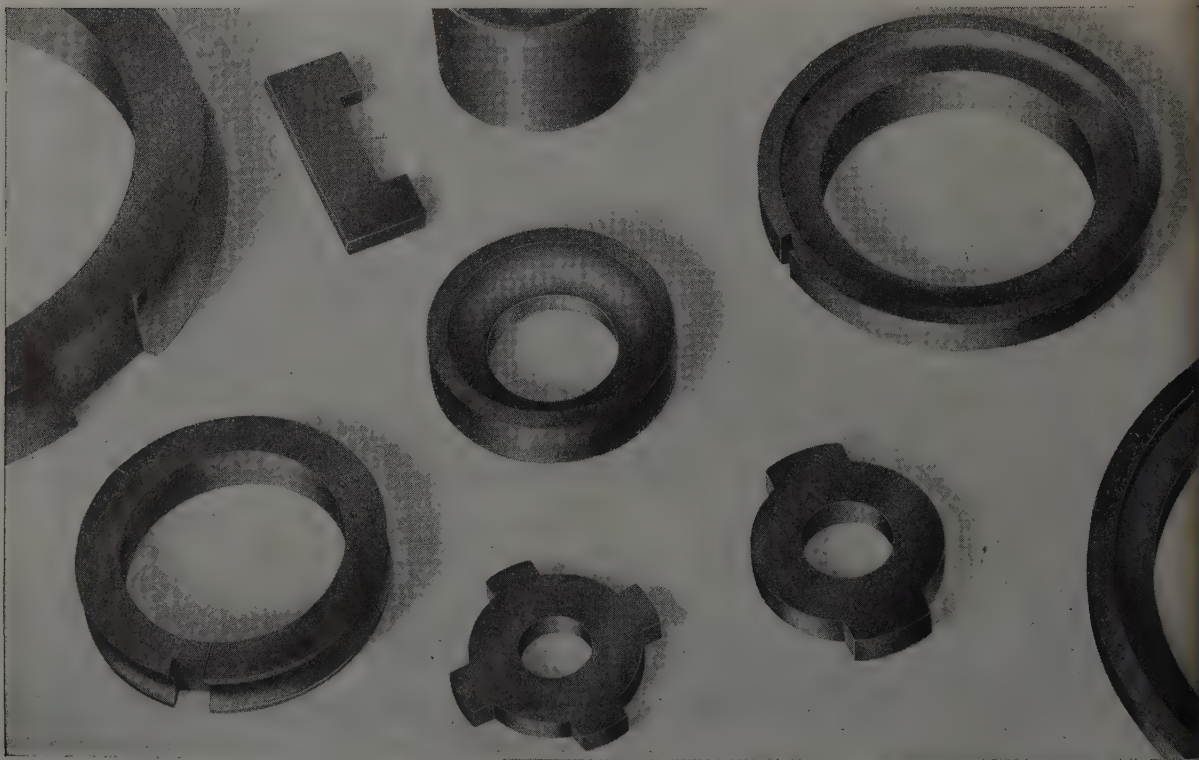
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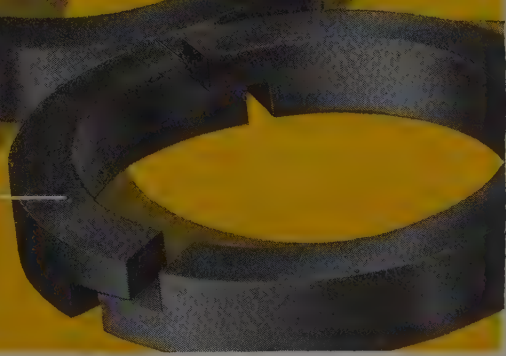
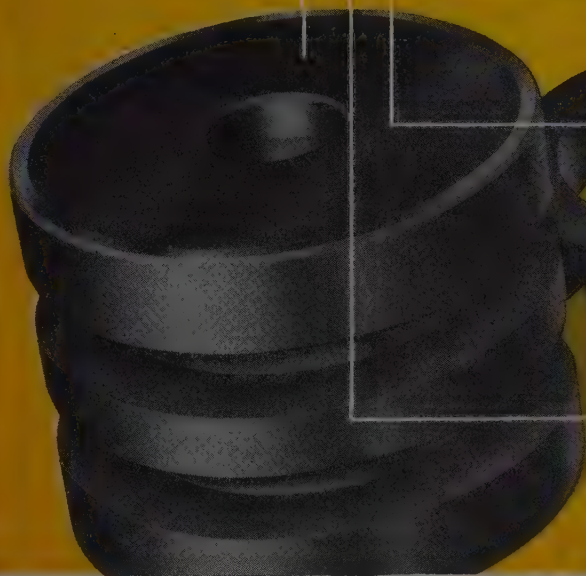
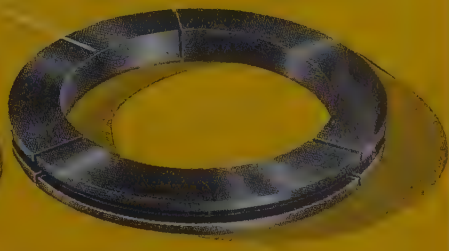
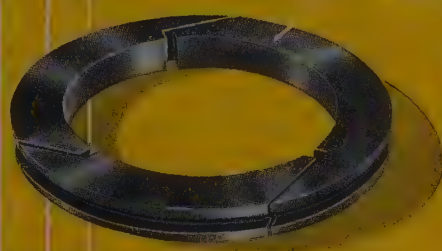
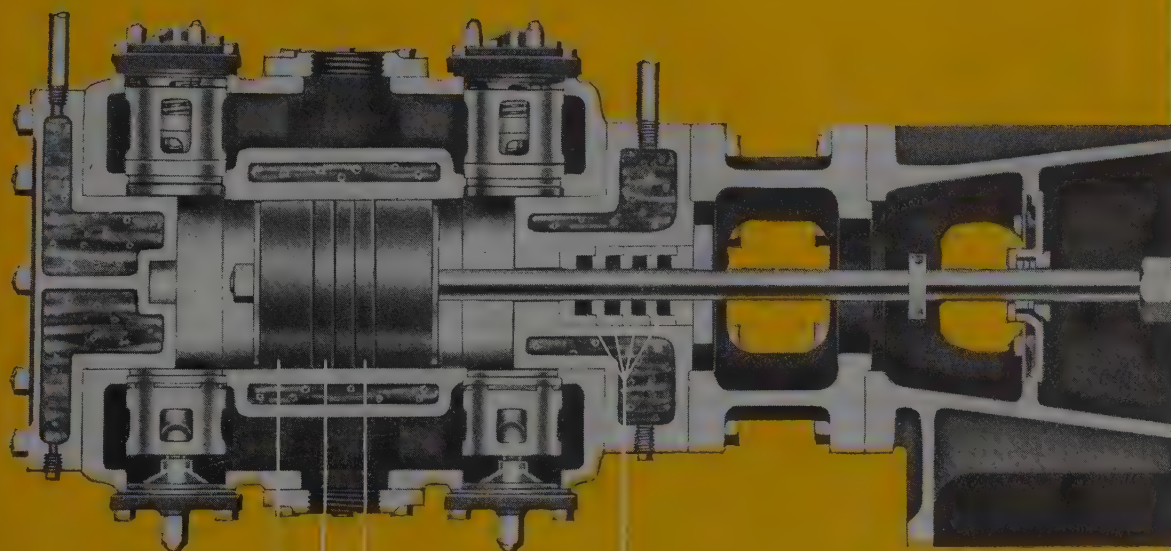
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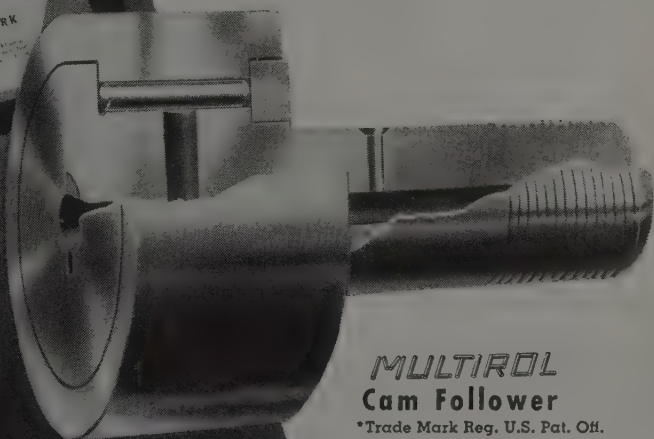
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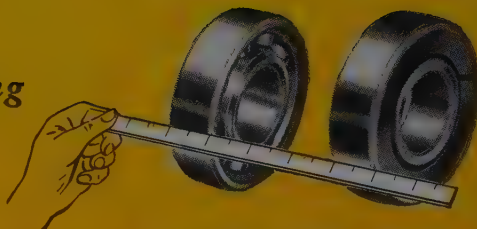


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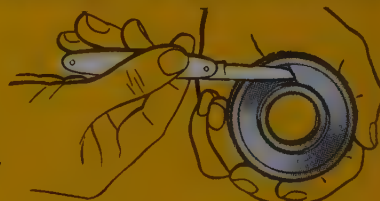
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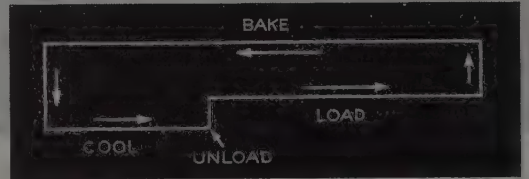
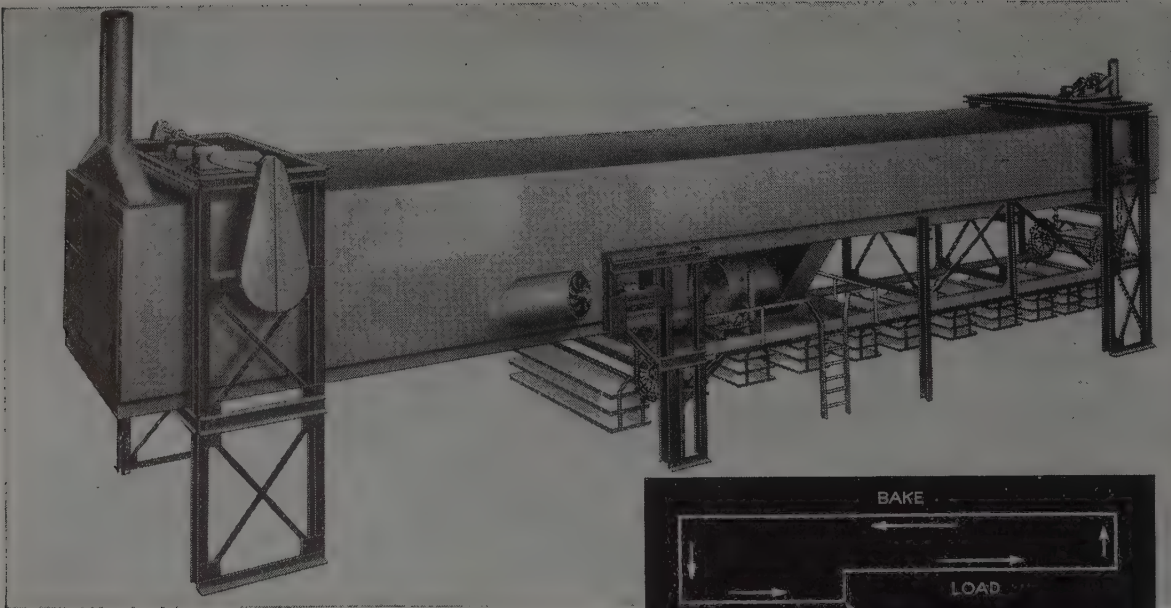
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The time-saving, space-saving, compact design of this new Horizontal Core Oven is characteristic of Young Brothers' Engineering. Into it went the skill and confidence of many years of experience . . . also a thorough knowledge of the job to be done and the production problems involved.

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The coremakers are located right next to the oven so that they can load the cores directly on the moving racks thus eliminating the necessity of transporting them on hand trucks or a conveyor from the core room. The location of the coremakers, at the oven, also saves core room space.

The size of the loading racks can be varied and the shelves can be adjusted to accommodate cores of many sizes and shapes.

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New **HORIZONTAL CORE OVEN** offers many cost saving advantages!



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HUNGRY PRODUCTION LINES

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LORAIN

HERE at Hudson, split-second timing in flow of materials is essential to keep hungry production lines operating on stepped-up schedules. And aiding this all-out production drive is a new 20 ton Model SP-414 Lorain self-propelled crane.

Traveling on 6 rubber-tire wheels (12 tires), this Lorain can pick up and go at the drop of a hat—move to any part of the yard at speeds up to 7 MPH. Power air steering controlled at the operator's position assures excellent maneuverability. Use of such interchangeable attachments

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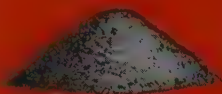
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TA-14075

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SHEFFIELD

MACHINE TOOL DATA

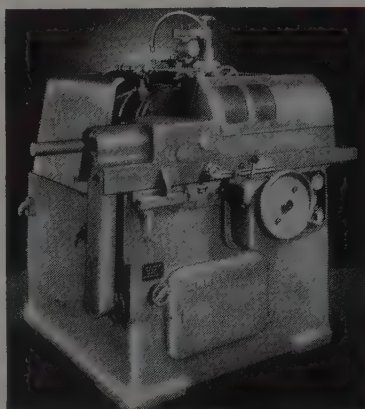
TFG - #123-4

NEW PRECISION ANNULAR FORM GRINDER FOR CRUSHTRUE GRINDING

Sheffield announces a Precision Annular Form Grinder as an addition to its line of precision grinders. This new machine utilizes the Crushtrue principle of wheel dressing for the rapid production of cylindrical forms such as circular form tools, crusher rolls, ball bearing races and seals, shift grooves in automotive and farm implement transmission gears, and other annular forms of intricate and precise profile.

MACHINE FEATURES:

Live or Dead Center Workhead
Infinitely variable work speeds
Semi-Automatic Power Crushing
Wheels form dressed up to 2" face
Swings 7" work 12" between centers
Precision work spacing device



Write for Engineering Data TFG 123 and 124

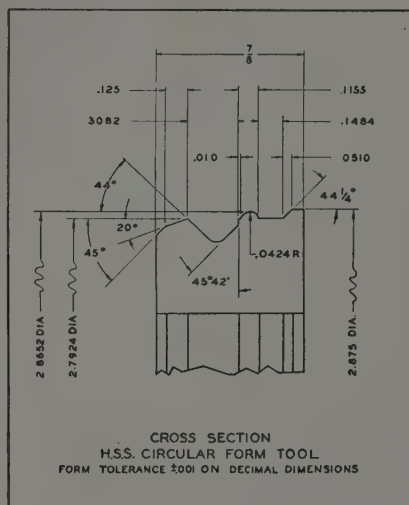
GRINDING TIME CUT FROM $4\frac{1}{2}$ HOURS TO 4 MINUTES

This circular tool has a contour involving a blend of radii, straight sides, angles and flats. Prior to using the Crushtrued full form wheel, the work had been made on universal cylindrical grinders by toolroom procedure in lots of 15 to 30, and the grinding time of $4\frac{1}{2}$ to 5 hours per tool was considered top performance.

A master Crushtrue Roll, made on the Micro-Form Grinder, was used to true the wheel on the Precision Annular Form Grinder shown above.

Grinding from the solid required 13 minutes. Grinding on preformed stock having approximately .020" on a side required less than four minutes.

The time required to make the Crushtrue roll compares with that of making the circular tool by conventional means. Therefore, the crush grinding process would show savings that become phenomenal as the quantities increase.



Previous grinding time	270 minutes
Crushtrue grinding time	4 minutes
Time saving	266 minutes
Percent Time Saved	98.5%

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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 120, NO. 19

MAY 12, 1947

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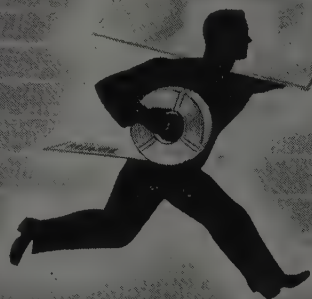
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★—Denotes regular features.

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Manufacture, Selection, Use of Files
Obtaining Mirror Finishes

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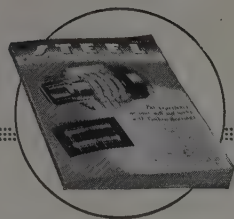
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AS THE EDITOR VIEWS THE NEWS

May 12, 1947

Peering Ahead

Manufacturers who are dependent upon a continuous supply of steel will be interested in a report of the Twentieth Century Fund entitled "America's Needs and Resources" which attempts to preview the economic life of the nation up to 1960.

The report goes into population trends, standard of living and other factors which bear upon the ability of Americans to consume manufactured products. From these data, it calculates the volume of industrial activity that will be required in 1950 and 1960 to meet estimated demand. On the basis of these calculations, the report predicts that activity in the iron and steel industry in 1950 will be approximately 40 per cent higher than it was in 1940 and that activity in 1960 will be 55 per cent higher than in 1940. Applying these percentages to the 67 million net tons of steel produced in 1940, we obtain indicated steel requirements of 93.8 million tons in 1950 and 103.8 million tons in 1960.

Is it likely that the iron and steel industry will have sufficient capacity to satisfy this demand?

The answer is reassuring. In the decade from 1930 to 1939, inclusive, steel ingot capacity increased 14.5 per cent. This figure is conservative because the decade included no "boom" years and spanned the most drastic depression in history. Allowing for an increase in capacity during the decade of the forties of this conservative 14.5 per cent, we arrive at an ingot capacity as of Jan. 1, 1950, of 93.4 million tons. Using the same conservative 14.5 per cent increase for the decade of the fifties, we derive an ingot capacity as of Jan. 1, 1960, of 106.9 million tons.

Comparing these capacities with the Twentieth Century Fund's estimates of demand, we find that in 1950 there will be a capacity of 93.4 million tons with which to meet a demand of 93.8 million tons. That this indicated deficiency of 400,000 tons need not be alarming is evident from the fact that steel ingot capacity already is 91,241,230 tons. To bring this up to the estimated requirements of 93.8 million tons in 1950 calls for an annual increase of only 850,000 tons, which certainly is not a formidable challenge. As for 1960, the estimate of capacity exceeds the estimate of demand by 3.1 million tons.

These figures are highly speculative but they do suggest that fairly optimistic estimates of future needs can be met by increases in capacity that are fully compatible with past experience.

• • •

AMERICAN BULLDOZERS: A survey of typical manufacturers of road building equipment shows that prospects for business for the next few years are exceedingly bright. The industry contributed importantly to the war effort and much of the experience gained during that period will prove a great advantage to manufacturers in meeting the heavy peacetime demand that has accumulated.

Reading of the postwar prospects of this industry reminded the writer that about a year ago in the Imperial Hotel in Tokyo he overheard a conversa-

tion in which an unusual compliment was paid to American-built earth-moving equipment.

A few Americans and former Japanese military men were conducting an impromptu post-mortem of the war. In response to questions by the Americans, the Japanese were citing mistakes they had made. In due course, a former Japanese naval officer spoke as follows:

"One of the great mistakes we made was to woefully underestimate the war potential of the American bulldozer. When one of your landing vessels backed up to the beach of an island, one or two

(OVER)

AS THE EDITOR VIEWS THE NEWS

bulldozers crawled out, proceeded to a predetermined spot and within an hour leveled off an area sufficiently large to permit the landing of heavy planes—when that miracle happened, natives all up and down the Pacific islands shook their heads and said that Japan was losing the war.”

This is a real tribute!

—p. 76

PROFITS AND WAGES: First-quarter earnings of some industrial corporations probably will elicit a barrage of comment from crackpots who see evil in short-term lush profits. Twenty steel companies reported net earnings in the March quarter that are 29 per cent above those of the preceding quarter.

Before jumping to unwarranted conclusions regarding this showing, the critics of profits should consider what the present high break-even point in industry means in terms of wages and job security over an extended period. First-quarter earnings are the result of near-capacity operations. Should activity in steel drop off appreciably, many steel companies would plunge into red ink, particularly because from Apr. 1 they are committed to absorb the new wage increase.

One wonders why union leaders and many employees place so much emphasis upon hourly rates and so little upon the number of hours worked per year. After all, annual take-home income is the thing that really counts.

—pp. 73, 74, 89

BETTER LOADING DOCKS: John V. Lawrence, managing director of American Trucking Associations, Inc., issues a timely plea to manufacturers to provide their plants with adequate shipping and receiving facilities. He declares that some managers who will move heaven and earth to effect a saving of a cent a unit in manufacturing costs will put up complacently with outmoded shipping and receiving docks that unnecessarily add “two, three or four cents to the unit cost.”

This will appear to be a severe indictment to executives in comparatively new plants erected in small communities or in the outskirts of large cities where ample provision has been made to handle rail and truck shipments. Nevertheless, the criticism is sound and constructive because there are thousands of older plants, many of them in congested districts, where truckers are forced to waste many costly minutes and sometimes hours before they can load or discharge a cargo.

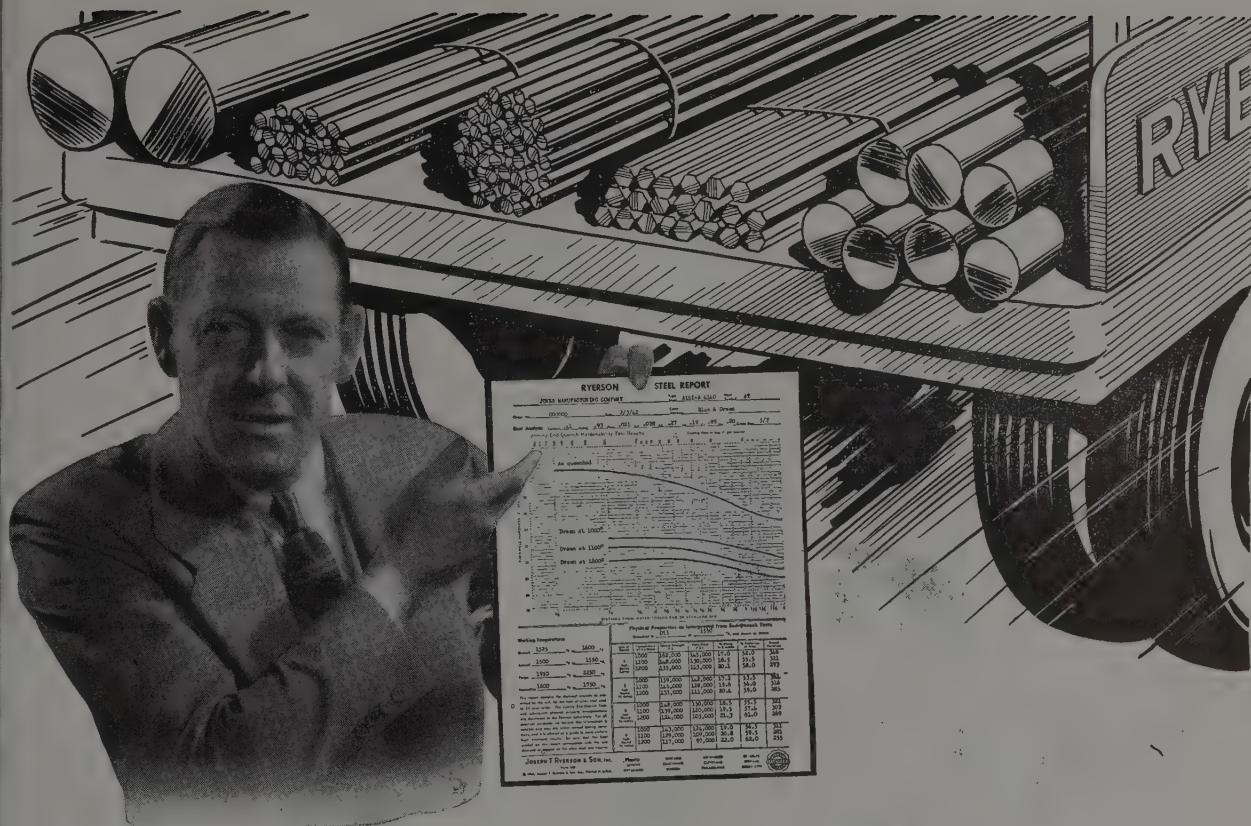
Is your shipping or receiving dock wasting your money?

—p. 84

SIGNS OF THE TIMES: A check-up indicates that the amount of ferrous scrap that can be obtained from government sources during the remainder of 1947 (p. 80) under no circumstances will exceed a million gross tons and probably will be less. . . . Harold T. Youngren, engineering chief of Ford Motor, has calculated that whereas the famous Ford model T engine developed 0.1 horsepower per cubic inch displacement at compression ratio of 4 to 1 (p. 90), the current V-8 engine develops 0.42 horsepower per cubic inch at compression ratio of 6.7 to 1. This represents an increase in efficiency of 400 per cent. . . . Departing from the traditional attitude of most steelmakers throughout the world, major steel producers in India have informed the government that tariff protection against foreign competition is not required (p. 80) due to the fact that low costs place Indian steelmakers in an advantageous position. However, it was pointed out that continuation of protective duties would be beneficial to India's steel expansion program. . . . Disposal of waste pickle liquor used for removing the oxide scale from steel may be facilitated by a new process developed at the Mellon Institute of Industrial Research. The process involves combining spent pickle liquor with coke oven ammonia (p. 121), another waste product. . . . Additional evidence that prospective builders are rebelling against high construction costs is found in a report of F. W. Dodge Corp. that in 37 states east of the Rocky mountains building contract volume per business day during the first three weeks of April was \$24 million (p. 94), compared with comparable rates of \$28 million in March and \$33 million in April last year. The decline is described as general in character, affecting nonresidential and residential building and heavy engineering construction. If this reluctance to build continues long, the effect will be significant because many economists have been counting upon construction activity to bolster the nation's economy when business in other lines falls off. . . . F. H. McGraw & Co., under contract to Carnegie-Illinois Steel Co., is cleaning, greasing and storing all equipment in the United States Naval Ordnance plant at South Charleston, W. Va. (p. 122) in a manner that will permit resumption of operations on short notice in case the facilities of the plant will be needed again.



EDITOR-IN-CHIEF



Ryerson Guide Data with Alloy Steel from Stock

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" 4615	" 8750	RY-ALLOY	
" 8617	" 9255	E 4340	
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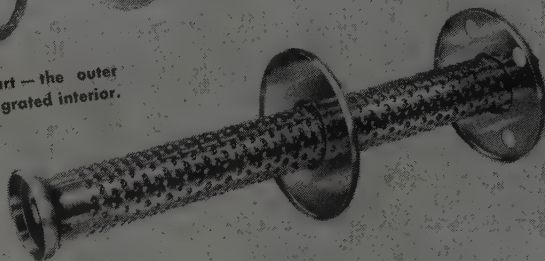
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with a promise for you



This standard muffler practically fell apart — the outer shell has been cut away to show the disintegrated interior.

But now that the problem has been solved by making a durable muffler interior of Inconel, there is every reason to expect that this new muffler interior will last as long as the truck itself.



Even in grueling cross-country service trucks can go half a million miles nowadays.

But the mufflers can't.

They burn out, corrode away and shake themselves to pieces so fast that truck owners have to lay up a truck ten times or more during its life to put in another new muffler.

But a well-known manufacturer of trucks and buses got an idea. He realized that airplane exhaust stacks have to stand up under conditions far worse than any truck muffler ever meets: Yellow-white heat. Corrosive attack by flaming exhaust gases. Incessant vibration.

Those airplane stacks are made of Inconel*, an INCO Nickel Alloy especially suited for high temperature service. And it's nothing unusual for them to last a million flying miles.

Why not try Inconel for truck mufflers?

That's exactly what the manufacturer did. After exhaustive tests on fifteen other alloys in comparison with Inconel he reports —

"According to our tests, we believe Inconel to be good for the life of the vehicle."

If you are looking for an answer to a high temperature problem, write for a copy of "Engineering Properties of Inconel." If your problem is different, one of the other strong, hard, corrosion-resisting INCO Nickel Alloys may be exactly what you want. Our technical assistance is yours whenever you ask for it.

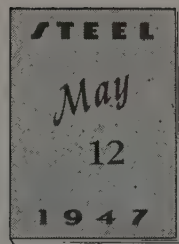
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Drop from Peak Steel Earnings Anticipated



First quarter aggregate net profit of 20 primary steel producers rose 29 per cent over that of fourth quarter of 1946 but higher wage and raw materials costs darken outlook for continuance of such a favorable income showing over the remainder of 1947

NET PROFIT of the steel industry in first quarter, 1947, rose 29 per cent over that in the fourth quarter of last year, but factors in the industrial situation serve to discourage any expectation that this favorable income showing will be continued over the remainder of the year. Indications are the first quarter will be the peak period in earnings for some time to come.

Compilation by STEEL shows first quarter net profit of 20 primary steel producers, representing 86.88 per cent of national ingot capacity, aggregated \$115,277,513. This compares with \$89,023,008 for the fourth quarter of last year and exceeds profits in any first quarter throughout the war period.

The iron and steel industry's annual rate of return on net worth based on first quarter earnings was lower than

in most other industries, however. The National City Bank of New York reports iron and steel companies with Jan. 1, 1947, net worth of \$3,403,353,000 had an annual rate of return of 13.1 per cent. Rate of return for other manufacturing groups ranged from 10.4 per cent to 26.3 per cent, with only two groups having rates lower than iron and steel.

While a heavy backlog of orders would seem to assure that steel production will continue at near-capacity rates for the remainder of 1947, increased costs of operations are certain. Recent increase in steelworkers' wages will add approximately \$153 million in direct labor costs for the last three quarters of this year if steel production is sustained at the first quarter rate. In addition, raw materials costs and expansion and re-

habilitation costs are on the upgrade, with the recent wage increase fanning out to supplying industries.

Offsetting of some of the higher costs by further increases in production can not be looked to with much hope inasmuch as the operating rate of steel ingot producers averaged 93 per cent in the first quarter this year. Not much higher average operations can be expected even under the most favorable circumstances. At the same time as supply-demand balance is attained, expected in most products after mid-summer, buyer resistance is likely to develop to a point where competition between mills for orders may force prices below current levels.

Part of the gain in the steel industry's first quarter net profits resulted from increased prices for products produced from raw material inventories obtained at costs substantially lower than those which will govern for the second quarter this year. Inventories have been replaced at the higher costs now prevailing, and consequently net earnings will be adversely affected.

Comparison of Steel Industry's First Quarter Net Earnings

	First Quarter 1947	Fourth Quarter 1946	First Quarter 1946	First Quarter 1942	First Quarter 1941	Calendar Year 1946
United States Steel Corp.	\$39,234,511	\$31,215,636	\$10,238,271	\$27,921,534	\$36,559,995	\$88,632,475
Bethlehem Steel Corp.	16,090,426	11,937,281	4,804,438	6,140,688	10,436,028	41,731,931
Republic Steel Corp.	11,516,795	6,539,055	347,413*	4,716,962	8,189,966	16,033,469
Jones & Laughlin Steel Corp.	6,337,132	4,744,824	813,246	2,491,718	4,160,507	10,854,084
Youngstown Sheet & Tube Co.	7,335,749	5,078,510	1,205,444	2,576,579	4,576,197	14,254,905
National Steel Corp.	7,325,058	6,520,331	2,083,356	2,675,837	5,430,389	20,461,651
Inland Steel Co.	7,995,857	5,656,124	1,046,958	2,689,090	3,469,046	15,556,897
American Rolling Mill Co.	5,918,876	6,063,807	1,804,487	1,731,635	3,599,241	18,552,491
Wheeling Steel Corp.	2,948,268	2,184,869	22,655	1,200,090	1,981,009	5,372,910
Colorado Fuel & Iron Corp.	1,712,323	876,310	1,667,932*	823,273	1,141,756	1,976,703
Pittsburgh Steel Co.	716,472	977,858	1,177,697*	645,334	889,700	46,635
Granite City Steel Co.	398,295	716,061	459,102*	77,657	93,195	481,696*
Sharon Steel Corp.	1,886,918	1,415,506	343,339*	250,302	527,253	2,857,856
Alan Wood Steel Co.	491,593	463,801	263,422*	217,040	351,794	793,941
Allegheny Ludlum Steel Corp.	1,829,609	2,040,207	252,043	915,644	2,720,164	6,599,346
Continental Steel Corp.	393,223	251,971	10,961	169,337	313,122	946,119
Crucible Steel Co. of America	891,810	323,697	1,742,750*	1,676,044	1,489,851	527,417
Keystone Steel & Wire Co.	1,342,815	1,175,392	528,901	364,083	410,137	3,379,018
Follansbee Steel Corp.	500,849	546,987	213,151*	165,308	29,930	1,220,635
A. M. Byers Co.	410,934	294,781	309,863*	368,263	290,561	562,048
Totals	\$115,277,513	\$89,023,008	\$16,286,091	\$57,816,418	\$86,659,841	\$249,868,835
Portsmouth Steel Corp.	1,009,320	743,028				

FINISHING CAPACITY ONLY

Acme Steel Co.	\$2,055,118	\$1,547,882	\$679,329	\$516,678	\$742,053	\$4,468,561
Superior Steel Corp.	275,743	308,265	36,678*	121,786	228,364	981,688

PIG IRON CAPACITY ONLY

Interlake Iron Corp.	\$965,031	\$819,949	\$246,607	\$444,762	\$774,855	\$1,937,305
Sloss-Sheffield Steel & Iron Co.	439,100	147,245	50,839	277,741	512,359	442,061

*Net loss.

Inland and Union Sign Agreement

Some nonbasic steel companies settle on basis of 12½-cent hourly increase, plus varying fringe concessions. Coal mine pact still in doubt

ALTHOUGH a few scattered strikes continue in the metalworking industries, the overall picture is one of peace. Most of the major steel producers have signed agreements with the unions, and the remainder apparently are in the final stages of negotiations. Two of the three major auto producers have wrapped up contracts and agreement between Ford Motor Co. and the union is considered likely within the next few weeks. Major electrical companies have signed.

Among the nonbasic steel or fabricating companies, the pattern has not yet been clearly defined; a few have signed contracts, a few are struck, and others have not yet reached the stage of final negotiations. Still questionable is whether the soft coal mines will continue in operation when returned to private owners June 30.

Inland Settles After Six Days

Inland Steel Co., Chicago, only major steel producer to be struck in the current dispute, reached an agreement with the union May 7, after being closed for six days, with five of seven blast furnaces banked and all open hearths and rolling mills down. Company hopes to regain full operations within a week.

Major economic points in the Inland agreement include: 1. Wage increase averaging 15.1 cents an hour; 2. equity settlement totaling in excess of \$2 million; 3. severance pay on a sliding scale under stated conditions providing three weeks pay after three years and progressing to ten weeks' pay after ten years' employment; 4. addition of a third week of paid vacation for employees with 25 years' service.

Company said the contract includes a "union responsibility" clause, and maintenance of membership with a 15-day escape clause.

Wilfred Sykes, Inland president, said "discussion has been prolonged because of an attempt to clarify previous contract provisions so as to avoid in the



Conferences between John L. Lewis, far left, and coal mine operators were adjourned last week until May 15, with no agreement reached on the issue of industrywide bargaining, opposed by southern coal operators. Conferences were called by Capt. N. H. Collisson, head of table, federal coal mines director, in an effort to restore collective bargaining toward a contract for private operation of the mines. NEA photo

future many misunderstandings such as have occurred in the past."

Allegheny Ludlum Steel Corp. and the union signed an agreement incorporating provisions more liberal than the United States Steel pattern. Under the pact, Allegheny Ludlum will bear all the cost of a far-reaching group insurance program providing each worker \$4000 life insurance and an additional \$4000 accident policy and coverage for sickness, hospitalization and surgical benefits. Families of workers are covered, including maternity cases, under terms of the insurance.

The contract provides for the basic 12½-cent hourly wage increase and other economic benefits. Average increase is figured to amount to more than 20 cents an hour.

A basic 12½-cent hourly increase, plus varying concessions on fringe issues, last week appeared to be providing the basis for settlement of the labor disputes in the nonbasic steel industry—those companies which consume rather than produce steel, but many of which hold contracts with the United Steelworkers of America-CIO.

With one exception, all the fabricating companies in the Pittsburgh-Ohio Valley district that had been struck had granted the 12½-cent increase. Generally the nonbasic companies do not have the problems of geographical wage differentials and job inequities which are characteristic of some of the larger basic producers. Not all of the companies have granted the union's demand for three weeks vacation for 25-year workers, severance pay or "call-in" pay.

A majority of cases among the nonbasic companies, however, remain to be settled. Contracts with the union expire

at varying dates up to the middle of June.

Customary union approach to the fabricators has been a demand for an increase of 15 cents or more (12½ cents basic increase, plus 2½ cents for fringe issues). Basic pay increase is to be retroactive to Apr. 1. Where companies have demurred from immediate agreement to these terms, strikes have been called in numerous cases, principally in New Jersey, Pennsylvania, Ohio, West Virginia—all areas close to major steel production centers. At one time last week, 23 plants, employing 15,000, were closed by union action.

Prior to the settlement of the wage issue in the basic steel plants, a number of the fabricators settled with union locals on a basis of wage increases ranging from 9 to 10½ cents an hour. Several others settled at 12½ cents and one or two at a higher figure. These agreements were not immediately approved by the parent union.

Coal mine operators will meet again with John L. Lewis, head of the United Mine Workers, on May 15 in an effort to resume collective bargaining toward a labor contract before the coal mines are returned to private ownership June 30.

First obstacle to be overcome is the issue of industry-wide bargaining which Lewis has said he will demand. The Southern Coal Producers' Association, representing a substantial percentage of the nation's coal mines, is opposed to industry-wide bargaining.

At several recent meetings of operators and Lewis, under the sponsorship of Capt. N. H. Collisson, federal coal mines director, no apparent progress was made.

Steel Prices "Fair and Reasonable," Olds Tells U.S. Steel Shareholders

Amount left in 1946 for reinvestment in business "much less than prudent judgment indicates as desirable." Stresses last year's profit was only 6 per cent on total sales and 5.5 per cent on investment in corporation

PRICES for steel products are fair and reasonable in the light of present-day costs and other relevant factors and the corporation's profits are neither excessive nor unjustified.

This statement was made by Irving S. Olds, chairman of United States Steel Corp., at the annual meeting of stockholders May 5. In effect, Mr. Olds said the corporation does not intend to reduce prices in the immediate future.

U. S. Steel believes that prices for steel products should be "adequate to cover all costs, including fair and proper compensation to employees, with a sufficient balance over and above costs to permit a fair return to stockholders in the form of dividends, and also something more to be set aside for the future needs of the business."

Mr. Olds said the amount left over for reinvestment in the business last year, about \$28½ million, was "much less than prudent judgment indicates as desirable to set aside for the future."

Low Profit Ratio Stressed

More attention often is paid to a comparison of the dollar volume of profits in one period with those of some previous period than to passing judgment upon whether the profits of a particular period are low or high in relation to sales volume or in relation to the total investment in the corporation. Profits in 1946 were equal to 6 per cent of total sales, including cement, shipbuilding, steel fabrication, of oil well supplies, coal chemicals, transportation services, etc. Net earnings were equivalent to 5.5 per cent on investment.

The annual meeting, the corporation's 46th, was attended by about 250 stockholders and was the largest gathering in the corporation's history.

Stockholders evinced a lively interest and possibly a dozen addressed the chair with questions, comments and suggestions. One suggested a 4-to-1 split in the stock to bring the price more within range of the small investor and widen stock ownership participation.

An employee of the company's seamless tube plant at Ellwood City, Pa., made an appeal for permanent continuation of operations at that property. He pointed out that last August the 4000 employees at Ellwood City were advised that the plant was to be closed within the next few years and that the opera-

tions would be moved to Lorain, O., and Gary, Ind. He declared many workers do not want to move to the western plants and that employees had offered to accept lower wages and reduced incentive pay if the plant continued to operate.

Chairman Olds replied that the Ellwood City plant was outmoded. It is not equipped to make the products most in demand today and is not located to serve present markets, which have moved westward.

J. Newcomb Blackman, New York, another stockholder, proposed a resolution, which found favor among the stockholders, that a committee representing

small and large stockholders be formed by management "to work with management on labor and government matters in order to emphasize the fact that both management and labor employment was made possible by stockholders' investments . . . and that in this manner the stockholders' interests may be prominently set forth and their investments and reasonable income assured and safeguarded."

A woman stockholder proposed that there should be a place on the board of U. S. Steel for a woman. "Women," she said, "have a stake in steel and steel has a stake in women."

Mr. Olds told shareholders that construction costs have increased by at least two-thirds since prewar and that the amount necessary to complete all authorized improvements and additions at the end of March was about \$284 million.

In outlining the corporation's expansion program, he stressed U. S. Steel's plans in the West. He cited figures showing the rapid industrial growth on the Pacific Coast and told of the corporation's plans to obtain a share of this business.

Present, Past and Pending

■ UNITED BOOKS WELSH ROLLING MILL EQUIPMENT

PITTSBURGH—A \$36 million order for rolling mill equipment for a new \$160 million steel mill in Wales has been booked by United Engineering & Foundry Co.

■ FIRST QUARTER WASHER, IRONER SALES SET RECORD

CHICAGO—Sales of household washers and ironers in the first quarter of 1947 broke all records and surpassed some previous highs by as much as 4-to-1, according to American Washer & Ironer Manufacturers' Association. Washer sales in first three months were 835,468, compared with 309,735 units in comparable 1946 period. Ironer sales were 113,190 units in first three months this year, compared with 19,552 in the same period of 1946, an increase of 478 per cent.

■ GM CAR-TRUCK PRODUCTION GAINS SLIGHTLY

DETROIT—Production of cars and trucks in General Motors plants for April totaled 175,262 units, up only fractionally from the 174,602 assembled in March. For the first four months of the year, GM built 631,044 units, compared with 1,000,138 for the comparable period in 1941, and with 77,889 last year.

■ WPB STEEL DIVISION ALUMNI ATTEND REUNION

PITTSBURGH—About 126 former members of the WPB-Steel Division attended a second reunion dinner here May 6. L. E. Creighton, chairman, Rotary Electric Steel Co., Detroit, was elected president of the group, succeeding Hiland G. Batcheller, president, Allegheny Ludlum Steel Corp., Pittsburgh.

■ STEEL SHORTAGES SLOW AUTOMOBILE PLANTS

DETROIT—Temporary shutdown of many Fisher Body Co. plants was necessitated by a shortage of steel. Nash auto output was reduced from 540 to 400 cars daily by scarcity of sheet steel.

■ SURPLUS TOOL PRICES FIXED IN WASHINGTON

WASHINGTON—WAA Administrator Robert M. Littlejohn told a Senate committee last week that prices for surplus machine tool and other capital goods and equipment will continue to be established at Washington. His testimony clarified a misunderstanding arising from earlier testimony to the effect that price fixing for surplus property was being decentralized.

Roadbuilding Machinery Builders Optimistic

Highway construction, rehabilitation and maintenance needs heavy. Construction equipment manufacturers report backlogs large. American Road Builders' Association estimates \$2 billion needed annually for highway program

By VANCE BELL
Associate Editor, STEEL

THE NATION'S road construction needs hold promise of a bright future for manufacturers of road building machinery.

Extent to which road construction will develop depends, of course, on economic conditions and the amount of money available for the work. Even in event of a recession, the improvement of roads cannot conveniently be delayed indefinitely for the overall condition of the nation's highways has deteriorated considerably as result of postponement of all but emergency construction and reduction of maintenance to bare minimum during the war. Furthermore, deterioration is more rapid than normally because of insufficient wartime maintenance.

If a recession does develop, highway construction projects might possibly form a substantial part of a program to provide employment.

In view of all the factors, the volume of planned and anticipated highway construction over the next several years is calculated in billions of dollars. For instance, expenditures in 1947 by all agencies is estimated by the American Road Builders' Association, Washington, at \$1.5 billion, equal to peak dollar volume recorded in 1930. In 1939, expenditures totaled \$869 million. However, in making comparisons with 1947, the present abnormally high price level must be considered.

To continue to improve and maintain

the nation's highways adequately, the expenditure should amount to at least \$2 billion annually for many years, says the association.

An idea of the mileage involved can be gained from the association's report that there are about 27,000 miles of federal aid highways which need reconstruction and possibly 60,000 to 80,000 miles of state systems which need rebuilding. In addition, there are about 14,000 miles of two-lane primary highways which are carrying four-lane traffic.

How badly the highway improvement program has suffered in recent years can be seen from figures on mileages of roads built by state highway departments. In 1938 they constructed 36,300 miles, but from then on through 1945 the mileage dwindled to less than half that amount, as the following figures indicate: 1939, 33,000 miles; 1940, 32,600; 1941, 32,600; 1942, 19,700; 1943, 15,900; 1944, 15,000; and 1945, 15,300.

A current impediment, of course, to road construction is the unbalance of costs, prices, and materials, but the American Road Builders' Association is hopeful that in the not far distant future obstacles will be at least partially removed.

Despite production handicaps, shipments of construction machinery (complete equipment only) during 1946 were valued at \$329 million, according to the U. S. Bureau of the Census. In addition,

parts and attachments valued at \$91 million were shipped by manufacturers, making a total value of shipments for the industry of \$420 million. While all of that equipment will not necessarily be used for construction of roads, much of it will be since it can serve on a road job as well as on some other type of construction.

Shipments of complete equipment showed marked increases during each quarter of 1946. During the first quarter they were valued at \$64 million, and by the fourth quarter they had advanced to \$107 million. In fact, fourth quarter shipments accounted for about one-third of the total shipments for the year.

The 1946 shipments of complete equipment, valued at \$329,239,149, were comprised of the following six classifications: Power cranes and shovels, \$81,423,524; road construction and maintenance machinery, \$88,610,011; dozers, \$20,190,496; tracklaying tractors, \$81,355,953; mixers, pavers, and related equipment, \$32,637,540; and miscellaneous construction machinery, \$25,021,625. While one of those classifications is road construction and maintenance machinery, it is not all inclusive,

R. G. LeTourneau Inc., Peoria, Ill., manufacturer of grading equipment, some of which is pictured at the left, sees its backlog of orders for road construction machinery increasing and views 1947 with considerable optimism





Building highways engineered to fit the needs of today's high-speed automobiles often necessitates cutting through hills and mountains and filling in valleys, a job requiring extensive earthmoving equipment such as the Caterpillar machinery pictured at work on a project near Redding, Calif.

for it does not embrace such other road building needs as pavers, tractors, etc., which are listed separately. However, much of the equipment in the six classifications could be used either for road work or for other types of construction for which it might be adaptable.

Factory shipments of complete construction machinery for export during 1946 (other than power cranes and shovels, for which no export data are available) amounted to nearly \$38 million. In addition, parts and attachments valued at \$18 million also were exported.

Continuing their upward movement, prices of construction machinery advanced 3 per cent during first quarter of 1947, compared with a 1 per cent increase during the corresponding period of 1946. These advances moved prices in March, 1947, up to a level approximately 20 per cent higher than in August, 1945, according to the U. S. Bureau of Labor Statistics. Since August, 1939, construction machinery prices have risen more than 30 per cent.

Higher quotations were reported for each month during the first quarter of 1947, with the bulk of the increase occurring in January. The greatest advances took place in prices of drilling and boring machinery, 7.2 per cent;

mixers, pavers, spreaders and related equipment, 5.8 per cent; and portable air compressors, 4.5 per cent. Increases ranging from 3 to 4 per cent occurred in prices of material processing equipment; power cranes, draglines, shovels and related equipment; and scrapers, maintainers and graders. Prices of track-type tractors and tractor-mounted equipment declined slightly in March, 1947, the bureau reported.

Confident about the future for the road machinery industry is the Foote Co. Inc., Nunda, N. Y., manufacturer of concrete and black top pavers. That company, through its president, D. D. Kennedy, said, "We feel the road construction equipment business will perhaps be the most favored industry for the next five or six years. The program adopted by the various states, as well as the federal government through financial aid, embodies a very ambitious plan—one which would present a big task to all manufacturers of road equipment."

Enjoying an excellent rate of incoming business, R. G. LeTourneau Inc., Peoria, Ill., views 1947 with considerable optimism. Not long ago, LeTourneau's order backlogs reached a peak and began a gradual decline. However, new products engineered for the

postwar market have turned the backlog upward. Because of its extensive development of a new 1947 line of earthmoving equipment the company anticipates a 200 per cent increase in demand.

For the LeTourneau company, 1946 was a year of uncertainties because of short supplies and strikes in suppliers' plants. Yet 1946 was the greatest peacetime year in the history of the company. "Acceptance of the new LeTourneau line, combined with our world-wide distributor organization, should without doubt produce in 1947 a sales volume far in excess of any previously enjoyed," said the company.

Caterpillar Tractor Co., Peoria, Ill., an important figure in the road building machinery field, still has a substantial backlog of orders even though it is doing its utmost to maintain maximum production. The company has in progress a \$30 million plant expansion program which gradually will have its effects in making increased production possible, but the full effects of the expanded facilities will not be obtained until sometime next year. Most important in the expansion program is a new diesel engine factory. This will produce benefits all along the line, partly because these engines constitute the power plants for most of Caterpillar's products and also because the transfer of engine manufacture from the present plant to a new factory will make space available in existing buildings for increased production of other components.

The \$30 million expansion program, largest in Caterpillar's history, is not just for meeting a temporarily abnormal need. It is the company's belief that world-wide use of its products is moving to substantially higher levels and that the resulting long-term expansion of demand requires a permanent increase in production facilities.

Demand Greatly Exceeds Capacity

In commenting on the outlook, P. H. Birkhead, vice president, Bucyrus-Erie Co., South Milwaukee, Wis., said: "The present demand for road building and construction machinery is greatly in excess of the capacity of the industry. As a result of the war, there is a large backlog of demand for excavating machinery, a large backlog of needed construction work and an increased interest in American-built construction machinery all over the world. In our opinion the outlook for the next several years is very good."

The Bucyrus-Erie Co., whose road building machinery includes shovels, draglines and cranes, and tractor equipment such as bulldozers and scrapers, reported that for this class of machinery its scheduled production rate this year represents an annual physical volume of

shipments slightly more than two and one-half times the volume of similar shipments in 1940 and about 60 per cent more than in 1946.

That company's backlog of orders for road building machinery represents about a year and a half of production at the current rate. Bucyrus-Erie has been handicapped, and still is, by shortages of labor and material.

Another manufacturer of construction equipment, the Koehring Co., Milwaukee, said its prospects for business in the road building industry are promising for the next several months. However, an insufficiency of steel is a handicapping factor. "The major portion of our production is in the crane and shovel and hauling fields, and in both these fields we are restricted from slightly better than prewar volume to two times prewar volume solely on a basis of steel deliveries alone," the company pointed out. "Backlogs of orders are at an all-time high for the industry, but as long as we are restricted to our present production volume it seems apparent the present production rates will remain for several months to come."

Asphalt Machinery in Demand

Another company citing the difficulty of obtaining sufficient steel and motors is Hetherington & Berner Inc., Indianapolis, manufacturer of asphalt mixing machinery. Robert Berner, president of the company, pointed out that during the war very few asphalt plants were built, those being constructed only by government approval for government roads, airports or war facilities. "After the close of the war there was naturally a large demand for this class of machinery, and we were booked to capacity," said Mr. Berner. "This year the demand is not as great, but we have a very comfortable backlog." He added that a fair demand now exists for asphalt machinery and that prospective buyers are becoming increasingly selective in their choice of equipment.

While insufficiency of steel is a handicap today to the Huber Mfg. Co., Marion, O., it is looking optimistically to the future. D. A. Howard, company president, said, "the road machinery industry is entering its most promising era. And as steel is forthcoming, road machinery builders will be ready for this new era of highway progress. Our company," said Mr. Howard, "is geared to increased production all along the line, and is fully ready to make use of expanded facilities just as rapidly as steel reaches us and our suppliers. Even accelerated production throughout our industry will not catch up with the demand for years to come. For at least a decade, our problem, I believe, will be one of production rather than markets."

West Coast Shipbuilding Holds Some of Its Wartime Gains

DURING the 20 months since the end of the war, the West Coast's shipbuilding industry has shrunk to only a fraction of its giant wartime stature. But when compared with its prewar position, the industry has gained considerably in size.

Although current prospects indicate further shrinkage in operations this summer, it is generally believed a good margin will be maintained over prewar.

As such, shipbuilding and ship repair will continue to provide an active market for steel, machinery, equipment of all kinds, and other products.

Gaging the size of the industry by the number of workers employed shows the following relationships: At the wartime peak, 447,500 persons were employed in West Coast private yards. At present employment is about 29,500, and the prewar total was 18,500 (in 1939). Navy shipyards are not included in these totals.

Again using employment as a yardstick, the following statistics show comparative positions:

California yards now employ 20,500, of which 16,100 are in the San Francisco area. During the war, peak employment reached 282,500 for California, with the peak in San Francisco at 185,200. Before the war San Francisco had 3000 of California's 4000 shipyard workers. In Pacific Northwest cities (chiefly Seattle and Portland) 9000 now are employed, compared with 165,000 at wartime peak and a prewar total of 14,500.

Tremendous Rise in Nation's Productivity Shown Due To Use of Mechanical Energy

INCREASED use of machines and inanimate energy is the main factor in the huge rise in production since 1850, according to a survey by the Twentieth Century Fund, *America's Needs and Resources*, showing that in 1944 the country turned out nearly 27 times as much in goods and services as in 1850, with a labor force only eight and one-half times as large but using 343 times as much mechanical energy.

Efficiency of the individual worker, in the long run, is a minor element in the productivity of the labor force, the survey states. The tremendous growth in output per man-hour in the last 90 years has been a result, not of harder or more

With one exception, all West Coast shipyards (excluding small boat yards) are engaged in ship repair rather than new construction. The exception is Bethlehem Steel Corp.'s Alameda yard which is working on two 23,000-ton luxury liners for the American Presidents line.

In addition to the main Alameda yard, Bethlehem also operates a small repair yard there. At present it is making repairs on five ships.

United Engineering Co., the second largest shipyard operation in the San Francisco Bay area, is employing about 5500 workers, equal to the wartime peak. This high level is due to the fact the yard is restoring and modernizing three luxury liners for Matson Navigation Co., at a cost of about \$8 million for each vessel. In addition, at the company's two yards, repair work is being done on 13 vessels. After reconversion of the Matson vessels, United Engineering expects to continue with repair work, although operations then will be considerably less than now.

Moore Drydock Co., operating in the East Bay, currently is engaged mostly in reconversion work.

General Engineering & Drydock Co., which also operates yards both in San Francisco and Alameda, is converting two vessels into refrigerator ships and has just completed reconversion of a passenger-cargo ship.

San Francisco shipyards report continued shortages of skilled laborers, and frequent scarcities of materials, especially items such as light gage steel sheets.

skillful work, but of use of "better machinery to augment human effort by the use of vast amounts of inanimate energy. What our labor force will be able to turn out in the 1950 decade depends on its size and on future trends in working hours, but more than anything else, on the extent of future gains in productivity."

Assuming productivity will increase at the average rate for all decades between 1850 and 1940, which was 18 per cent, total output of goods and services in the United States in 1950 is seen at \$177 billion and in 1960 at \$202 billion. These estimates are at 1944 prices, which are about 15 per cent below present levels.

the survey explained. If productivity can increase at the rate it did for the two decades before the war, 21 per cent from 1920 to 1930 and 42 per cent from 1930 to 1940, the nation's gross product could be worth nearly \$200 billion in 1950 and \$249 billion in 1960.

Answering the question "Doesn't use of machines cause technological unemployment?", the survey states that although individuals are displaced, in the long run "it is only through technological unemployment that material progress is possible." Increasing use of machines has resulted in a rise in the number and proportion of the population that is gainfully employed and a progressive shortening of the work-week. The long-term downward trend in average working hours per week will continue, the survey indicated, from close to a 70-hour week in 1860 to less than 41 hours in 1950 and 38 hours in 1960.

The study shows that national output since 1850 has been closely related to the total energy expended and the ratio of about 2.8 horsepower-hours per dollar of net output has changed very little since that time. Mineral energy (including water power), which was of small importance in making the 1850 gross product, now, however, has almost displaced manpower and animal power.

Projection of this trend into the future shows that by 1960 minerals will be doing nearly 99 per cent of the non-human work and the labor force will be doing over 100 times as much mineral energy per man-hour as it did in 1850.

How the modern use of power and machinery saved manpower during the war is illustrated by the survey's analysis of the size labor force which would have been required in 1944 if working hours and productivity had remained at the 1850 level. Under these conditions a working force of 190 million—three times the number actually employed—would have been required. If 1944's shorter work-week is considered, 100 million additional workers would have been needed.

The future outlook, according to the survey, is for technological progress to continue, and perhaps at an accelerated rate; however, increase in productivity should not be taken for granted, the survey warned. "It will be determined, as it has been in the past, by a multitude of actions and decisions on the part of individuals — inventors, industrial managers, entrepreneurs, investors, workers and consumers," the study declared.

Acetylene Group To Meet in Cincinnati May 20-21

The International Acetylene Association, which will hold its 47th annual convention at Hotel Gibson, Cincinnati,

May 20-21, has announced its program will include the following speakers and topics: W. T. Whalen, R. K. LeBlond Machine Tool Co., Cincinnati, "Flame-Hardening Machine Tools Parts;" Eldon Hurt, Haynes Stellite Co., Kokomo, Ind., "Mechanized Hard-Facing;" C. E. Bellew, Air Reduction Co. Inc., New York, "Applications of Stainless Steel Cutting;" and A. F. Chouinard, National Cylinder Gas Co., Chicago, "Foundry and Forge Use of the Oxy-Acetylene Processes."

Sessions on May 21, to be held at the University of Cincinnati, will include the following papers: "Powder Cutting and Scarfing with the Oxy-Acetylene Process," D. H. Fleming Jr., Linde Air Products Co., Newark, N. J.; "Low Temperature Brazing," A. M. Setapen, Handy & Harmon, New York; "Fundamentals of the Oxy-Acetylene Welding and Cutting Process," J. I. Banash, consulting engineer, Chicago; "Fields of Application of the Oxy-Acetylene Processes," R. B. Swope, Southern Oxygen Co., Washington; and "Opportunities in the Welding Engineering Field," Charles E. MacQuigg, Ohio State University, Columbus, O.

American Steel Warehouse Group To Meet May 12-15

Program for the 38th annual meeting of the American Steel Warehouse Association which opens May 12 at the Biltmore Hotel, Los Angeles, has been an-

nounced by Walter S. Doxsey, president.

Sessions on Monday, May 12, will include meetings of the association's executive committee and the board of directors.

Tuesday's program will include welcoming speeches by E. Jungquist, president, Southern California chapter, and vice president of the association; Harrison Fuller, president, Bethlehem Pacific Coast Steel Co., and A. B. Ordway, vice president and general manager, Iron & Steel Division, Kaiser Co. Inc. Mr. Doxsey will speak on "The State of the Association."

"Labor Relations in the Steel Warehouse Industry" is the topic of an address to be given by William B. Seymour Jr., assistant vice president, Joseph T. Ryerson & Son Inc.; and Reese H. Taylor, president, Union Oil Co., will speak on "Our Side of the Story."

Following the general meeting of the association on Wednesday morning, at which time directors-at-large will be elected and the treasurer's report read, William M. Jeffers, vice chairman, Union Pacific Railroad, and Mr. Seymour will talk on "Labor Relations—Where Do We Go?" and "Answers to Your Labor Problems."

Earl L. Shaner, president, Penton Publishing Co., and editor-in-chief, STEEL, has chosen for his topic "New Horizons for Steel" at Wednesday's afternoon session. "Credits and Cash Discounts" will be discussed by Dr. Park J. Ewart.

Calendar of Meetings . . .

May 12-14, Canadian Association of Equipment

Distributors: Annual convention, General Brock Hotel, Niagara Falls, Ont., Canada.

May 12-15, American Steel Warehouse Association:

38th annual meeting, Biltmore Hotel, Los Angeles. Association president is Walter S. Doxsey, 442 Terminal Tower, Cleveland.

May 12-15, American Mining Congress: 1947

annual coal convention and exposition in Cleveland. Association secretary is Julian D. Conover, 309 Munsey Bldg., Washington.

May 12-15, Second Annual National Marine Exposition: San Francisco.

May 15-17, Society for Experimental Stress

Analysis: Annual meeting, Stevens Hotel, Chicago. Society's address is P.O. Box 168, Cambridge 39, Mass.

May 19-21, Industrial Furnace Manufacturers' Association: Annual meeting, The Homestead,

Hot Springs, Va. Association executive vice president is Stuart Clarkson, 420 Lexington Ave., New York.

May 20-21, International Acetylene Association:

Annual convention, Hotel Gibson, Cincinnati. Association headquarters are at 30 E. 42nd St., New York.

May 21-22, American Iron & Steel Institute:

55th general meeting, Hotel Pierre and the Waldorf-Astoria, New York. Institute headquarters are at 350 Fifth Ave., New York 1.

May 21-24, American Society of Mechanical Engineers: 19th national conference on oil

and gas power, Cleveland.

May 22-24, Automotive Engine Rebuilders Association: Silver anniversary convention at

Hotel Statler, Detroit. R. C. Patterson, 415 N. Capitol Ave., Indianapolis, is association executive vice president.

May 22-31, Mid-America Exposition: Cleveland

Public Auditorium; show of goods made and

used in area bounded by Detroit and Buffalo, Cincinnati and Pittsburgh.

May 23-24, Institute of Metals Division, AIME:

Boston regional conference, Hotel Sheraton, Boston. Conference chairman is H. I. Dixon, Sterling Alloys Inc., Boston.

May 26-27, Association of Iron & Steel Engineers: Annual spring conference, Benjamin

Franklin Hotel, Philadelphia.

May 26-29, American Society of Mechanical Engineers: Aviation meeting, Los Angeles.

May 27, Metal Powder Association: Third annual spring meeting at Waldorf-Astoria Hotel, New York.

June 1-6, Society of Automotive Engineers:

Summer meeting, French Lick Springs Hotel, French Lick, Ind.

June 2-4, American Gear Manufacturers Association: 31st annual meeting, The Home-

stead, Hot Springs, Va. Association executive secretary is Newbold C. Goin, Empire Building, Pittsburgh.

June 2-4, National Association of Purchasing

Agents: Annual convention, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

June 5-7, Electric Metal Makers Guild Inc.:

Fifteenth annual meeting, Hotel Roosevelt, Pittsburgh. Association president is J. F. Arthur, Box 6026, Mt. Washington Sta., Pittsburgh.

June 9-11, American Coke and Coal Chemicals

Institute: Annual meeting, French Lick Springs Hotel, French Lick, Ind. Association executive secretary is Samuel Weiss.

June 9-17, University of Iowa: Management

course on production planning, job evaluation, motion and time study, wage incentives and related subjects. Iowa City, Iowa.

Government Scrap Seen Restricted

Potential supply fairly large but not more than 1 million tons likely to emanate from various agencies in 1947

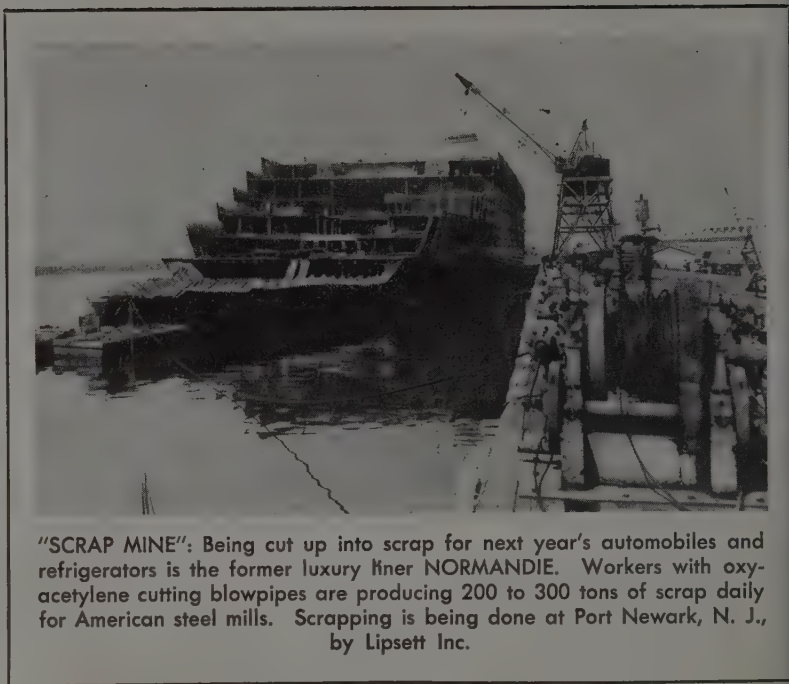
CANVASS of actual and potential iron and steel scrap held by government agencies indicates the total tonnage may be fairly large. Unfortunately, nobody knows how large it is and it will take months, in some instances years, to develop the needed information. In fact, the size of the tonnage will depend on numerous decisions still to be made—as what ships the Maritime Commission will decide to offer for scrapping, and what over-age and single-purpose machine tools the War Assets Administration will decide to sell for scrapping.

Best information obtainable is that ferrous scrap to emanate from government sources under no circumstances will exceed a total of 1 million gross tons over the remainder of 1947, with the likelihood it will be less than that figure.

War Assets Administration Scrap: This is probably the most promising potential source over the next few months. Belief is that local scrap committees to be organized by the new Steel, Foundry and Scrap Industries Committee for Expediting Iron and Steel Scrap (STEEL, Apr. 21, p. 62) will find plenty of scrap in WAA inventories.

The WAA recently decided to sell as scrap some 80,000 special-purpose machine tools which, the armed services said, have no further value in their present form; these tools mostly remain to be sold.

Maritime Commission Scrap: It takes time for the commission to inspect damaged and over-age vessels and determine whether it is in the country's interest to declare them ready for sale as scrap. The commission opened bids May 7 on 12 over-age and damaged ships containing an estimated 46,000 gross tons of potential ferrous scrap. Many other ships will be scrapped, but they will come out in the market a few at a time. The time schedule is illustrated by the fact that since the Maritime Commission inaugurated its scrapping program in the fall of 1945 it has put up for sale, including those bid for on May 7, 151 ships



"SCRAP MINE": Being cut up into scrap for next year's automobiles and refrigerators is the former luxury liner NORMANDIE. Workers with oxy-acetylene cutting blowpipes are producing 200 to 300 tons of scrap daily for American steel mills. Scrapping is being done at Port Newark, N. J., by Lipsett Inc.

with a total scrap content of 563,786 tons.

Army-Held Overseas Scrap: Chances are that the quantity of such scrap available for shipment to the United States will prove much smaller than anticipated. The Army Quartermaster General sold to B. D. Bender, of Shreveport, La., 150,000 tons of Army-generated ferrous scrap in Germany and Pentagon Building spokesmen say this cleans up the Army scrap in Germany that can be shipped to the United States at present. There is no knowledge in Washington as to the quantity of battlefield and bombing and rubble scrap in the United States-occupied zone in Germany, but it is expected that the Allied Military Government—United States will turn over most of it to the Germans. Some already has been turned over to German consumers, and some has been shipped to Swedish and Belgian plants that are making certain materiel for our occupying forces in Germany.

Incidentally, the Bender-bought scrap brought a price of \$7 a ton as and where is plus \$3 to cover loading aboard ships at Bremen. The minimum freight to United States Atlantic ports appears to be \$12 to \$13 a ton on tight loading, namely, 50 cu ft per gross ton of scrap. Inasmuch as much of the scrap cannot be stowed so tightly, it is believed the delivered price on this scrap at Atlantic ports would have to be something above \$23 a gross ton.

A policy under which at least some United States Army-held scrap in the United States-occupied zone in Germany

hereafter will be sold only with the stipulation that it be shipped to the United States has just been promulgated by the Office of Military Government for Germany (U. C.). This information is contained in a letter dated March 31, sent by Maj. Gen. Frank A. Keating, United States deputy military governor in the United States zone, to L. D. Greene of the recently organized Steel Foundry & Scrap Industries Committee for Expediting Iron & Steel Scrap (see STEEL, April 21 issue, p. 62).

Navy-Held Overseas Scrap: Navy estimates from the field indicate that Navy-held scrap on Pacific islands comes to a total of approximately 200,000 "measurement tons." Naval authorities in Washington are not yet sure just what this indicates but it is believed that the quantity of this scrap is well below 200,000 gross tons. The Navy, because it has to turn over to the Treasury Department any income from the sale of scrap or other surplus property, is unwilling to spend any of its hard-won appropriation dollars on bringing the Pacific scrap to the market in the United States. It is willing to sell the scrap on a where is and as is basis—and is about to take two experts on a tour of Pacific islands to study the situation. They are L. G. Knight, Bethlehem Pacific Coast Steel Corp., Seattle, and Leonard C. Abrams, Atlas Steel & Supply Co., Cleveland. When they return they will report their findings to the new scrap committee which then will consider a course of procedure aimed at bringing this scrap to the United States.

Year's Surplus Tool Disposal Plans Reviewed

WAA reports efforts made to speed sale of tools and minimize effect of program on new tool builders

REVIEW of War Assets Administration's progress in disposing of surplus machine tools is included in the agency's quarterly report to Congress for the period ended Mar. 31, a year after WAA took over the disposal activities of predecessor agencies. During the year, \$13.3 billion of surplus property was liquidated, and, according to the report, more than half of the total surplus has been moved into private hands.

Inventory of machine tools is estimated by the agency at 200,000 units, having a value of \$750 million, which makes it the largest single class of surplus personal property. Approximately 180,000 tools have yet to be declared surplus.

The agency has earmarked and is withholding from sale such machine tools and other production equipment as are required by the War and Navy departments for industrial reserves. Only such equipment as is not in short supply domestically and is not an essential part of plants to be disposed of as operating units is included in these earmarked reserves, which at the end of March comprised 10,324 tools. When this program is complete, it is expected about 71,000 tools and items of production equipment will be transferred to the services.

Although recent disposals of used surplus tools have been about twice the amount of new tools shipped by the machine tool building industry and WAA's inventory is about five times the value of the industry's unfilled order backlog, the agency reports it is making every

effort to stay within the Surplus Property Act, which stipulates that surplus property shall be disposed of so as to avoid dislocations in the economy. These efforts include sale of tools in long supply to buyers who, it is thought, would not purchase new ones; sale of tools unsuitable for civilian applications for scrap and salvage of usable parts; and sale at nominal prices to educational and public health institutions. Tools which are in short supply are being sold and are aiding in relieving the pressure on tool builders; however, the agency admitted, certain companies in the industry may be adversely affected even though the whole industry maintains a high output.

Price of tools by WAA has been determined in a number of ways. Standard general purpose tools in short supply are sold at relatively high prices established by the Clayton formula, which provides for a price based on original cost less percentages for length of time in active use. Tools in long supply are priced at about 25 per cent of cost. During 1947's first quarter, prices were reduced on 247 models of tools.

Over 300 types of surplus tools were made available in 1947 to schools and hospitals at nominal prices. This program is expected to be extended to other long-supply categories of tools.

Over-age and special machine tools, representing about one-third of the total inventory, are sold by competitive bidding. Although some of these tools might be altered or repaired for peacetime uses, relatively little interest in this direction has been shown because of availability of standard general purpose tools.

To promote export of surplus tools and accelerate disposals in the domestic market, in February a policy of granting discounts to dealers buying fixed-price tools for their own account for resale was established. This discount, currently 12½ per cent, is available to machine tool manufacturers, rebuilders, exporters, dealers and other distributors. The "approved dealer" plan, providing for a 12½ per cent commission for dealers handling surplus tools, continues in operation.

Congress Probes Cancellation of Surplus Tool Sale

High WAA official says he did not know of agreement not to withhold tools in short supply and in demand by industry

WHY was a scheduled surplus machine tool sale at Wright Aeronautical plant, Lockland, O., canceled on telegraphed order from Washington after many dealers and other potential buyers had stood in line all night to attend the sale? This was the question put by the Senate Surplus Property Subcommittee to Brig. Gen. James Mollison, associate director of the War Assets Administration, who ordered the cancellation. The committee was still seeking an answer last week.

Sen. Homer Ferguson, committee chairman, produced a letter in which interested government agencies agreed that no machine tools "in short supply" were to be held by the WAA for standby purposes as long as such tools were in demand by industry. General Mollison pleaded ignorance of the agreement at the time he ordered the sale cancellation.

Other congressional investigations into WAA activities also are under way. The House Surplus Property Subcommittee is inquiring into a WAA contract with the George A. Fuller Co., a construction and engineering firm, to dispose of certain surplus goods in the Salt Lake City, Utah, and Denver areas. The committee is questioning why WAA, which had just been authorized to recruit an additional 35,000 personnel and which already had 1500 people in offices at Denver and Salt Lake City, found it necessary to contract with a private company to do the disposition job.

PIG IRON AND FERROALLOY PRODUCTION FOR MARCH AND YEAR TO DATE

Blast Furnace Capacity and Production—Net Tons										March, 1947	
	Number of companies	Annual blast furnace capacity	PRODUCTION								
			PIG IRON		FERRO MANGANESE AND SPIGEL		TOTAL				
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Percent of capacity		
									Current month	Year to date	
DISTRIBUTION BY DISTRICTS:											
Eastern.....	11	12,551,280	941,014	2,724,090	25,287	76,607	966,301	2,800,697	90.6	90.5	
Pittsburgh-Youngstown.....	16	25,042,040	2,002,040	5,769,664	10,497	48,865	2,012,537	5,818,529	94.6	94.2	
Cleveland-Detroit.....	6	6,557,500	521,705	1,508,091	-	-	521,705	1,508,091	93.6	93.2	
Chicago.....	7	14,097,710	1,085,738	3,097,132	-	-	1,085,738	3,097,132	90.6	89.1	
Southern.....	8	4,924,670	330,530	969,960	8,648	27,861	339,178	997,821	81.1	82.1	
Western.....	4	2,536,000	196,356	531,871	1,042	5,530	197,398	537,401	91.6	85.9	
TOTAL.....	36	65,709,200	5,077,383	14,600,808	45,474	158,863	5,122,857	14,759,671	91.8	91.1	

Labor union leaders lobby vociferously to stave off restrictive labor legislation, but apparently have little influence on Congressmen. Bring only objections, no constructive suggestions for curing ills in labor-management relations

SOME of the most belligerent "lobbying" that Capitol Hill has experienced in the memory of the present generation of legislators has occurred of late when delegations of rank-and-file union leaders came to Washington in an all-out drive to stave off labor legislation. They represented both CIO and AFL unions; the CIO men were far in the majority and were also the most vociferous.

Congressmen reacted in various ways. Waited on by a large delegation of CIO officials from Ohio, Senator Robert Taft sat with them for more than an hour. He quickly found it futile to attempt to answer their complaints and for the most part just listened. He closed the session abruptly when a CIO official from Akron, who said he also was a Republican committeeman, declared that "the followers of Abraham Lincoln should have enough statesmanship to solve this problem fairly."

Of the many similar sessions throughout the Senate and House office buildings, that of 125 CIO union leaders from Indiana was the most spectacular. Hear-

ing of the impending visit, Senator Capehart rounded up the Indiana congressmen and received the CIO men in the Senate caucus room.

Rep. Roy Madden, who wrote the minority report condemning the House labor bill, got a hearty round of cheers. Others did not fare so well. When Rep. Gerry Landis admitted that he had not liked all features of the House-passed bill, a CIO man from South Bend barked "Well, why in hell did you vote for it?"

Congressmen from New York State heard some strong talk from a group headed by Marx Lewis of the United Hatters, Cap & Millinery Workers International Union—AFL. The legislators who voted for the House bill, said Mr. Lewis, are upsetting good labor relations and paving the way for chaos and confusion; they are playing into the hands of the Communists. The simple fact is, he said, "many congressmen need an intensive course in labor-management relations."

It is doubtful whether these labor vis-

itations changed the viewpoints of any appreciable number of congressmen. "It was not the rough treatment," a House member told STEEL. "Rather, it was the fact that the union men, as usual, again came in with only objections; they did not have a single constructive suggestion for curing a situation which is so urgently in need of remedial action."

Far from feeling that the House-passed bill, and the bill now shaping up in the Senate, will be too strong, many members of Congress feel that additional legislation will be needed later on. The proposed joint congressional committee for studying remaining labor-management relations problems, they say, will have plenty to do.

For instance, Senator Capehart, in a session of the Senate Small Business Committee blamed inadequate labor laws for the continued attrition in the number of small companies due to mergers with larger organizations.

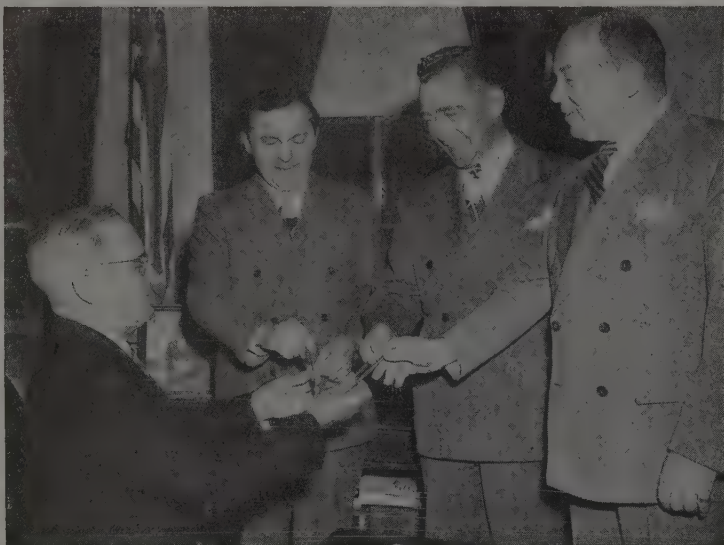
Inability To Compete Blamed

"Big business," said Senator Capehart, "is taking over small businesses pretty much at the request, in many instances, of small business, in that small business is unable to compete. . . . They are discouraged over government regulation, government controls, and they are discouraged over labor legislation. They are discouraged over the fact that the pattern is set in labor rates by the big fellows by virtue of industry-wide bargaining."

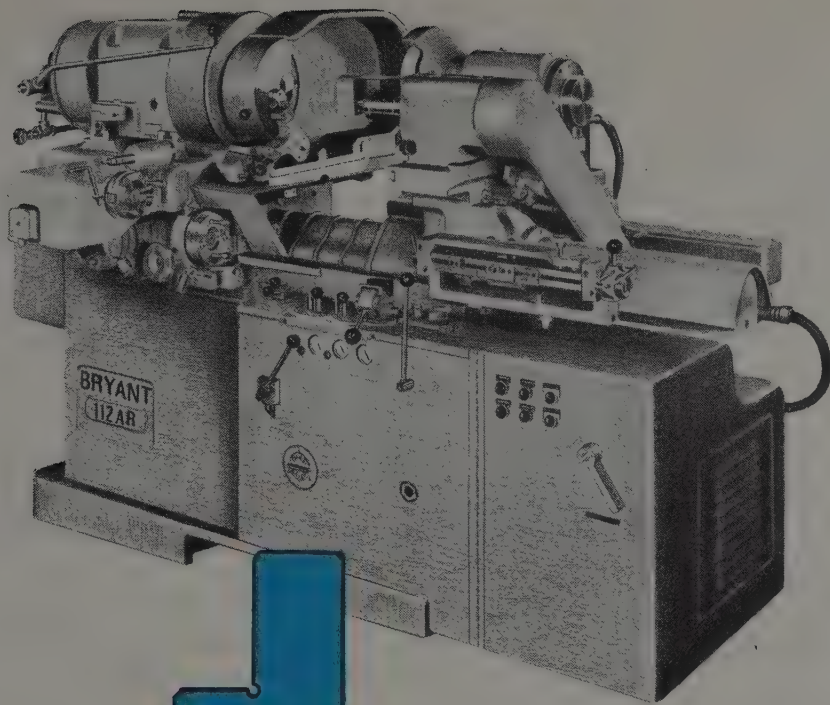
"For example, your CIO steelworkers have the local bargaining rights in literally dozens and dozens of small companies through the nation that have no relationship whatever to steel. This union dictatorship is increasing costs and that accounts to a large extent for little fellows dropping out and the big businesses picking them up."

Incidentally, Senator Capehart's reference to the practice of the United Steelworkers—CIO to negotiate a contract with the steel industry and then force thousands of fabricators to accept the same contract without any consideration of the factors involved in their situations is only one of numerous remarks by legislators proving that they are well aware of this incongruous state of affairs.

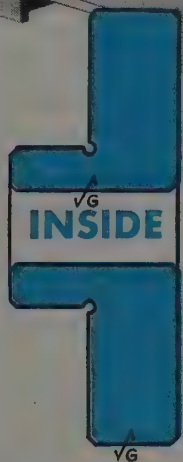
The statements made before the House and Senate committees by fabricators associated with the Non-Basic Steel Co-ordinating Committee (STEEL, Feb. 24, p. 55) unfortunately failed to stimulate needed action; the bill which will be sent to the White House this session will not protect the steel fabricators from the necessity of accepting the same terms that are arranged be-



SIGNS COPPER BILL: President Truman signs HR-2404, an act to suspend certain import taxes on copper, and presents the pens used in signing to witnesses. Left to right: President Truman; Rep. Robert A. Grant (Rep., Ind.); Rep. James T. Patterson, (Rep., Conn.); and John Danaher, former senator. NEA photo



For Grinding



and OUTSIDE Diameters in a Single Chucking

The new No. 112-AR Bryant fills the need for a fast, precise machine for grinding internal and external diameters in a single chucking of the work — for reducing production time on parts where concentricity is an important factor. The 112-AR has two wheelheads carried on a common longitudinal slide. The workhead indexes from one spindle position to the other on a transverse slide, and is controlled by separate feedscrews at each of these positions. This machine will grind two separate diameters, one of which may be an outside diameter, as well as the face of the work. For facing operations, a turret stop and axial feedscrew are provided.

A similar machine, the new No. 112-AH, is designed for grinding one inside diameter and a face to extremely close squareness limits. This machine has a feed-screw for internal diameter control and an axial feedscrew for facing operations.

These two hydraulically operated grinders have a maximum swing of 16" and grinding stroke of 9"; workhead is adjustable to grind an included angle of 90°.

THE NEW NO. 112-AR

**ANOTHER BRYANT
POSTWAR DEVELOPMENT**

Send for the Man from

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

BRYANT



tween the union and the steel producing industry. But a large number of congressmen now are well aware of this situation and know that it calls for eventual action. In the meantime, the manner in which the CIO steelworkers union will handle the steel fabricators over the next week or two probably will have a bearing on the writing of a future labor bill.

Interior To Retrench

So as not to run any chances of getting caught with an unauthorized payroll in case its appropriation for the next year emerges from Congress on the pattern of the bill adopted by the House, the Interior Department has prepared a retrenchment program which can be put into immediate effect upon final action on the Hill. All bureau plans are to be cut; that of most immediate importance from the standpoint of metals is the Bureau of Mines program. Instead of the \$17 million asked for the Bureau of Mines, the House allowed about \$10.5 million.

Tentatively scheduled for closing July 1 are these major plants: Electrolytic manganese pilot plant at Boulder City, Nev.; bauxite beneficiation mill at Bauxite, Ark.; rotary kiln sponge iron pilot plant and laboratory at Laramie, Wyo.; and the lignite gasification pilot plant at Grand Forks, N. Dak.

Smaller pilot plants slated for closing are: Tunnel kiln sponge iron and tungsten metallurgy plants at Raleigh, N. C.; zinc dithionate, vanadium and antimony plants at Salt Lake City, Utah; electrothermic magnesium plant at Pullman, Wash.; pyrometallurgy plant at Boulder City, Nev.; and the alumina plant at Rolla, Mo.

In addition, construction will be halted on a zirconium pilot at Albany, Oreg.; studies will be abandoned on iron ore beneficiation at Tuscaloosa, Ala., and on steel at Raleigh, N. C.; and metallurgical research will be drastically curtailed in remaining plants—50 per cent at least in most instances.

All explorations for new coking coal reserves must be abandoned, says the bureau, if the House-approved cut is sustained.

Better Loading Docks Needed

American manufacturers for years have realized the importance of low-cost production but, strangely enough, a vast number of them have failed to appreciate the substantial savings that can be effected by providing their plants with adequate shipping and receiving facilities, according to John V. Lawrence, managing director, American Trucking Associations Inc., Washington.

"On a simple article the production manager will find that by junking all

his fairly modern equipment and buying some new tools he can save—say—a penny a unit. He can sell such a proposition to the head of the business without much difficulty," says Mr. Lawrence.

"At the same time, however, antiquated shipping and receiving facilities may be adding two, three or four cents to the unit cost of the article and nothing is done about it to any great extent.

"The situation is especially bad in cities where, no matter how the goods enter the city, nearly all of them have to be delivered by truck. And yet, due to congestion of the streets, and inadequate loading and receiving facilities, trucks often have to cruise around for a long time before they can stop in front of a particular building and make a delivery. Many modern buildings have only one loading space for truck deliveries and shipments. Trucks go there by appointment as one goes to the dentist, and if one of them is slightly delayed the whole schedule is messed up.

"What can be done in many instances is illustrated by what happened when our people, just before Pearl Harbor, were called into consultation to help solve the problem of handling trucks at one large Army depot. They had two tailgate spaces in an enormous building. By cutting in on a lower floor on one side of the building 45 spaces were provided. This particular depot, as a result, became one of the chief consolidating stations for war shipments when we entered the war.

"The average businessman may ask why he should spend money on such facilities. After all, he will say, that is the problem of the trucking concern that serves his building. By not providing proper facilities, however, he is raising the cost of that terminal transportation and if he does not think that he is paying for it, he is just kidding himself."

Economic Report Readied

In the next few weeks the initial report will be made public on one of the most important studies now going on in the 80th Congress. It will emanate from the Joint Committee on the Economic Report and will deal with the question: How can we avoid, or mitigate, after World War II, the disastrous and universal depression which always heretofore has followed in the wake of a major war?

On the basis of advance information, the report will take sharp issue with the present administration policy of encouraging wage increases while at the same time calling for price reductions "out of profits." This policy, the report will point out, means nothing more than encouraging continuous inflation on the income side, with the exercise of moral

suation to prevent manufacturers and sellers from getting any of the benefit of that inflation.

Commenting on existing possibilities of avoiding a long-drawn-out postwar depression on this occasion, C. O. Hardy, the joint committee's staff director, said that in one respect the economists of the present day are better situated to map out a plan of preventive action than were those of 25 years ago. That is, their equipment of economic facts is much more ample than it has ever been before.

But they are having as much trouble as ever with two other phases of planning—first, the need for formulating dependable forecasts from these economic facts and, second, determining on the best program of action to be helpful if these forecasts are correct.

CPA Being 'iquidated

Civilian Production Administration, recently transferred to the Department of Commerce for liquidation, has sent out dismissal notices to 550 of its 585 remaining employees. The 35 people to be retained are in the rubber division which will continue to exercise controls after June 30. Legislation now before Congress would continue controls on some other products as cordage, tin, quinine, etc. If this is enacted, some of the pending dismissal notices will be withdrawn.

Commerce also is at work on a plan to skeletonize the Office of Price Administration, which it will take over June 5. Dismissal notices will start almost immediately to go out to the remaining employees on the OPA payroll.

To take care of the remaining CPA functions, Commerce has organized an Office of Materials Distribution in charge of Horace B. McCoy, on leave from his post of director of the Office of Domestic Commerce. Mr. McCoy has designated the following staff to assist him in the OMD: Chemicals, Frank E. Bennett; metals, Frank H. Hays; cordage, Franklin P. Kidd.

Sonnett Succeeds Berge

John F. Sonnett has been named assistant attorney general of the United States to replace Wendell Berge as head of the Justice Department's Antitrust Division. Mr. Berge left that post May 1 to enter private law practice in Washington. Mr. Sonnett's selection resulted to a large extent from his recent successful handling of the government's injunction and contempt prosecution of John L. Lewis and the United Mine Workers of America growing out of the coal miners' strike during the period of government operation of the mines.



Earl O. Shreve, vice president of General Electric Co. and new president of the Chamber of Commerce of the United States, receives congratulations from Eric Johnston, left, one-time president. Looking on is Harlan Peyton, center, a new director of the chamber. Mr. Shreve succeeds William K. Jackson as president.
NEA photo

Wide Range of Topics Discussed At Chamber of Commerce Meeting

Speakers blame government interference for many of industry's problems. Earl O. Shreve, newly elected president, sees answer to high prices in greater production. Favorable 1947 outlook seen in many fields

GREATER production is the key to lower prices, according to a consensus of the representatives of American industry who attended the 35th annual meeting of the Chamber of Commerce of the United States in Washington recently.

Attitude of numerous speakers at the convention was summed up by Earl O. Shreve, the chamber's newly elected president, who stated: "Talk alone will not bring down prices. Nor will the American people be fooled by attempts to make businessmen scapegoats and to blame business alone for the wage-price spiral. An ounce of production will weigh more in the price scales than a pound of words."

Mr. Shreve who is vice president in charge of consumer relations, General Electric Co., Schenectady, N. Y., began his tenure of the chamber's top office with the advice that prices cannot be talked down solely by "moral suasion" as President Truman has suggested.

The chamber's Committee on Economic Policy rebuked the Truman administration for its one-sided policy in attacking prices of manufactured goods, pointing out that food prices have risen

91 per cent above 1939 levels, while non-food items have gone up 31 per cent. Average hourly factory earnings during the same period increased 85 per cent.

"How To Counteract Depressions" was the theme of a session which included addresses by Rufus S. Tucker, economist, General Motors Corp., Detroit, Dr. Richard B. Heflebower, economist, Brookings Institution, Washington, and George W. Terborgh, research director, Machinery & Allied Products Institute, Washington.

"To maintain prosperity," Mr. Tucker asserted, "the essential thing is to maintain a prospect of profits for businessmen who are willing to produce goods that the public wants while continually giving the public more for its money."

Outlook for a number of industries, representing important segments of the national economy, highlighted the chamber's meeting. Otto Herres, vice president, Combined Metals Reduction Co., Salt Lake City, Utah, in an address entitled "Effects of Imports on Domestic Industry—Minerals," protested against the influence of government bureaus and departments in molding public opinion

to support increased imports of minerals which are in sufficient domestic quantity. He said domestic mineral resources are known to be sufficient beyond immediate concern in iron, aluminum, magnesium, manganese, molybdenum, coal, sulphur, potash and phosphate rock.

"A great threat to the domestic mineral industry," he cautioned, "is that too much part by government in economic affairs may place us on the road leading to the permanent controls of a managed economy. The government would do better to co-operate and assist the mineral industries by furnishing an incentive for exploration and development of mines producing essential metals and minerals and an inducement for initial production from new operations."

Merle Becker, vice president, W. C. McBride Inc., St. Louis, and H. H. Hill, Producing Department, Standard Oil Co. (N. J.), New York, speaking as did Mr. Herres at the luncheon session headed titled "Foreign vs. Domestic Mineral Supply," discussed the outlook for the petroleum industry. Mr. Becker told the chamber that during the last quarter of 1946 this country became a net importer of petroleum for the first time in more than 20 years, except for a brief period during the war when foreign trade was disrupted. Preliminary figures for the first part of 1947 indicate an even greater shift toward an unfavorable trade balance, he added. Mr. Hill reported American Petroleum Institute estimates of proved oil reserves have shown a gradual increase each year since 1934 and in 1946 were approximately 21 billion barrels.

Car Shortage Held Exaggerated

"The Railroad Outlook" was discussed by R. V. Fletcher, chairman, Transportation Study Committee, Association of American Railroads, Washington. Commenting on the freight car shortage, he said it had been exaggerated and as an example pointed to the week ended Mar. 1, 1947, when the shortage amounted to 36,183 cars of all classes. Actual carloadings were 850,000, making the shortage less than 5 per cent of demand. "Upon a conservative view, it is safe to say that the railroads are meeting at least 90 per cent of the demand for cars," he said and added: "In the first thirteen weeks of this year, the railroads have handled 10,518,015 loaded cars, a greater number than were handled in the similar period of any one of the past four years."

To overcome the shortage, the railroads on Apr. 1 had ordered 95,497 new freight cars and had programmed 41,200 additional for future order, he said. The cost of these cars, together with 2562 passenger cars and 634 locomotives now on order, will be about \$900 million, of which \$600 million will be expended this year, he pointed out.

Power and Fuel Plants, Railroads Given Priority for British Steel

Coal shortage expected to hold United Kingdom's steel output to less than 10 million tons in 1946, against 12 million or more anticipated before fuel crisis. Manufacturers suffering for want of raw materials

BIRMINGHAM, ENG.

PRIORITIES have been fixed for the steel industry giving preference to electricity generating plants, mining, gas undertakings, equipment for the coal-oil conversion program and freight locomotives and railway cars. A further priority will be devoted to steel for the industrial application of atomic energy at the government's two research stations.

What remains of the yearly production of steel will be allocated to remaining steel-using industries. It is expected that a further priority list to cover the chief exporting industries in the steel line will be established later, but it is understood that output of export industries will not depend entirely on their steel allotment.

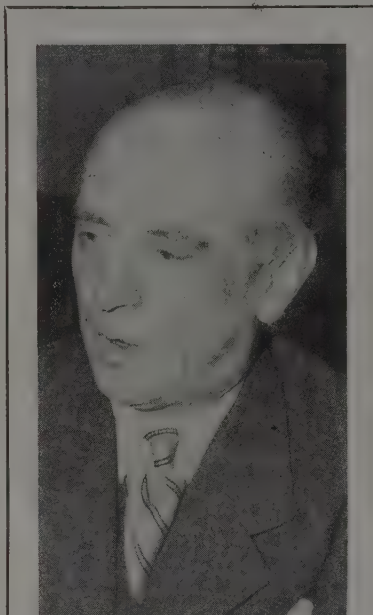
Steel, Iron Output Drops in March

For the present, coal supplies for Britain's iron and steel industry are not going to be increased beyond the present 75 per cent level, and the industry does not expect to produce more than 10 million tons of steel this year unless more generous treatment is given it. This coal allocation was laid down under the pre-crisis Cripps plan and was adhered to when the general industrial allocation was reduced to 83 1/3 per cent. The latter has now been raised to 50 per cent. It is estimated that with a 100 per cent fuel allocation the industry could produce fully 12 million tons of steel this year. Production in March suffered more severely than in February and dropped to an annual rate of about 10 million tons compared with just over 13 million in March, 1946. Pig iron production fell to an annual rate of 6,400,000 tons against 7,660,000 in the corresponding month of 1946.

Problems will arise for those industries outside the list of priorities, and it is feared some industries will be unable to get sufficient material for their requirements and as a result will be unable to maintain full employment.

Priorities have also been fixed for pig iron so that the collieries and electricity and gas undertakings will receive preferred attention. There is a widespread feeling that the moment has arrived when something should be done as works are overloaded with orders and manu-

facturers have had to use their own discretion as to the respective importance of various jobs. For some time consumers have had the utmost difficulty in getting additional business placed be-



GO-BETWEEN: Berger Dahlerus, Swedish industrialist, who served as liaison between the British and Germans during the latter part of World War II, now is visiting in the United States. He is shown at a press conference in Washington. NEA photo

cause of existing congestion. There is a shortage of foundry pig iron and little prospect of additional furnaces being put into blast. On the contrary, one or two furnaces have recently been transferred from the production of foundry to basic pig iron in view of the urgent need for steel.

Re-rollers are in difficulties because of the short supplies of steel coming from British makers. Mills engaged on strip, light sections and sheets have always been dependent to a large extent on imported material. There are prospects that more imports may be possible later

in the year particularly from America and from Europe as production is now rising in France and Belgium after a temporary decline. The sheet mills are still very congested in spite of the numerous cancellations at the end of the first quarter, but there is an unprecedented demand for sheets for industrial and housing work.

Such important industries as shipbuilding are suffering from the lack of raw materials and fuel at a time when order books reveal a bigger tonnage than has been known for many years. A great deal of construction work including much rebuilding of war-damaged premises is still held up for lack of material, and although a steady tonnage is going to the coal mining industry, it is not enough to meet requirements. The transport situation still presents difficulties since the railway companies have not yet replaced their losses of rolling stock and locomotives during the war, and there are also miles of rail tracks waiting to be replaced with new steel rails. Consequently steel producers frequently find themselves with material laid up in works whereas the steel is urgently required by consumers and transport is not available.

Some improvement is taking place in the export trade of the South Wales tin plate industry due to some increase in production and also the fact that export prices are advantageous at the present time as compared with domestic rates. The galvanized sheet works in South Wales are still congested with orders and in this industry exports are severely restricted. The scheme in favor of reconstruction of the Welsh sheet and tin plate industry has been submitted to the Minister of Supply, and an early announcement concerning the plan is expected.

Only a few works are producing wrought iron bars, but additional business has been obtained due to the stringency in the steel trade. On the other hand, there are very few orders for strip and this may be attributable to the high price as compared with steel.

The report of the British Electrical & Allied Manufacturers Association Council for 1946-47 suggests that although attention has been directed to the shortage of generating plants and equipment the fundamental shortage is that of generating stations. The extension, fitting and construction of these must precede the increased production planned for plant and equipment.

Indian Steelmakers Say They Need No Tariff

JAMSHEDPUR, INDIA

Major steel producers in India have informed the government that tariff pro-

ection against foreign competition is not required by their companies, due to the fact that low costs place Indian steel-makers in an advantageous position.

It is pointed out, however, that a continuation of protective duties might be required in the interest of future expansion of the Indian steel industry to million tons over the next seven years.

The Indian Tariff Board was requested by the government to look into the question of protection, and to discuss it with members of the industry. A conference of interests which are affected has been convened.

Sir Ardeshir Dalal, representing the Tata Iron & Steel Co., said his company had informed the government in 1937 that the company would not require any protection against foreign competition after 1940. The company still maintains this view.

Sir Padamji Ginwala, representing the Indian Iron & Steel Co. Ltd. and the Steel Corp. of Bengal Ltd., announced his companies did not need protection. He believed, however, a continuation of protection would be beneficial to the expansion program.

The conferees agreed there is no imminent danger of foreign competition because (a) owing to the overall world shortage of steel there is little exportable surplus available in other countries; and (b) prices quoted for foreign steel are higher than current prices of Indian steel.

In particular, it was believed there is no immediate danger of competition from either the United Kingdom or the United States. Only potential source of cheap imports of iron and steel appears to be from Australia.

Belgium Lifts Some Price Limits on Industrial Items

Decontrol of prices on a number of industrial products was recently effected by the Belgian government, which under the leadership of Premier Paul Henri Spaak, is hopeful of liberating the entire market from price regulations as soon as a greater variety of goods are more plentiful.

Steel products "placed under the regime of normal prices" include the following: Bridges; framework; boilers; material for railways and tramways; general electrical equipment; fans; compressors; pumps; hoists; cranes; weighing machines; and general machinery for all industries except for manufacture of construction materials such as sand, plaster, etc. Leather industrial belting was also placed on the list as were some products in the following industries: Food; tobacco; textiles; timber and chemicals.

France Looks to Saar District for Coal; Russia Holds Up Agreement

United States and Great Britain willing that Saar should be incorporated in French economy and that France should receive greater shipments of coal from Germany pending final disposition of problem

PARIS
PROPOSED agreement by United States, Great Britain and France that coal from the Saar will go to France when the Saar is incorporated into the French economy, and a further understanding providing for an increase in German coal exports to France, pending final settlement of the question, are the main topics of conversation in industrial circles here. Agreement is being held up by refusal of the Soviet Union to give its approval.

It is estimated that France will receive in April as its share of Ruhr and Saar production 193,000 tons of coal against a minimum requirement of 500,000 tons. By the terms of the new agreement it will get 370,000 tons a month by the end of this year if the Saar problem is still unsolved and 600,000 tons a month if the Soviet Union agrees to the economic incorporation of the Saar territory. It is foreseen that next year importation of 1,000,000 tons a month from Germany might become possible, plus the output from the Saar. These figures are dependent upon the Soviet acceptance of the Saar plan; they are based on a new sliding scale system worked out by the three western powers in Berlin and in Moscow.

Exports will be fixed in terms of percentages of net merchantable coal production beginning at 21 per cent when the daily output of clean hard coal in the western zones reaches 280,000 tons a day and rising to 25 per cent when it reaches 370,000 tons a day. When the integration of the Saar in the French economy has been decided upon the European coal organization will be notified that Saar coal is no longer available for joint distribution. At that time France's share in Ruhr coal will be revised. France will still obtain some Ruhr coking coal directly and will be able to trade Saar coal for Ruhr coal.

Saar production is now 33,500 tons a day and is expected to rise to 40,000 tons in 1948.

This crucial coal problem has been solved satisfactorily for France thanks to the concessions on the part of the United States and Great Britain.

This agreement ought to have an important influence on French international and home policy. The Saar coal dis-

trict has an area of 445 square miles. The depth of the bed is 2000 meters and the reserve estimated in 1938 by the Geological Institute of Prussia was 3.2 millions of tons at a lowest level of 1100 meters. There are 22 mines in the district.

Total production in the Saar district was as follows:

Coal (metric tons)		
Year		
1937-1938	.....	13,783,000
1939-1940	.....	11,858,000
1941-1942	.....	14,692,000
1942-1943	.....	15,618,000
1943-1944	.....	16,211,000

Coke (metric tons)		
1937-1938	.....	2,926,000
1939-1940	.....	2,046,000
1941-1942	.....	3,287,000
1942-1943	.....	3,304,000
1943-1944	.....	3,545,000

Iron, steel (metric tons)		
	1937	1944
Pig iron	2,186,565	2,500,000
Steel ingots	2,350,321	2,750,000
Rolled steel	1,824,754	2,000,000

For the first six months of 1946 the output of steel ingots for the principal steelworks was:

	Tons
Dillinger Huttenwerke	233,071
Woklingen (Edelstahlwerk Roehling)	339,162
Burbacher Hutte (ARBED)	274,886
Neue-Kircher Eisenwerke	358,050

The Saar has an important production of electricity with 1.2 million kwh. Most of the electrical plants belong to the mines.

Provisional figures of iron and steel output in France for March follow:

Pig iron	408,000 tons
Steel ingots	488,000 tons
Rolled steel	363,000 tons

Studies Proposed Plans For Argentine Steel Industry

A proposed program for developing the steel industry in Argentina has been disclosed by G. D. Thompson, president and chairman of the board of Pittsburgh Steel Foundry Corp., Glassport, Pa.

Mr. Thompson, who returned recently from the South American country, declared that his firm was well equipped to build the rolling mill equipment which will be required for the program. The government would produce the basic steel which it would sell to finishing mills in ingot or billet form, he said.



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UNIT OF NATIONAL STEEL CORPORATION**

Mirrors of Motordom

Chrysler shows favorable profit while operating at 70 per cent of capacity. New wage increases may alter picture considerably. Assemblers gently urging suppliers to re-examine costs and suggesting price reductions

DETROIT

FAVORABLE profit showing of Chrysler Corp. in the first quarter on a production of about 206,000 cars and trucks was not too surprising even though the corporation's plants were operating at only 70 per cent of capacity. Chrysler has always been a good performer financial-wise under sustained volume production, perhaps more so than any other automotive company. Chrysler stock reacted quickly, jumping over 10 points in a single day on the strength of the good financial showing and reports of a two-for-one split in the stock.

Optimism must be tempered by the fact a 10 per cent increase in wage cost now must be absorbed, although against this will be the positive factor of still greater volume in the second quarter. Some quarters described the Chrysler earnings as "excessive" and grounds for reductions in car prices. This type of reasoning is typical of the topsy-turvy economic thinking so prevalent these days which would have car prices, as well as automotive wage rates, tied to the profit the manufacturer is able to earn.

Higher Output To Present Problems

If the industry is able to turn a substantial profit at a production level of 100,000 units per week, and such appears to be the case, it may well be giving thought to abandoning plans for moving production ahead to the 125,000-unit level which was being talked some months ago. For one thing, supplies are fairly well in balance under present conditions, and even if steel, for example, should become available in greater tonnage, there is danger some other material, such as copper, castings, glass or the like, might lag behind and thus force a continuation of the current assembly position. Further than that, it would appear to be a reasonable policy to level off production with the idea of deferring as long as possible the arrival of a buyer's market and the possible necessity of scaling back production. This would tend to stabilize employment and to ease somewhat the pressure on parts suppliers.

Most sellers of parts and materials to automobile producers over the past

few months have been under steady pressure gentle urging from car builders to re-examine their costs and prices with a view to making price reductions, or at least holding the present levels.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	442,242	140,738
April	452,157*	248,108
May		247,620
June		216,637
July		331,000
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908

12 ms. 3,268,456

* Preliminary.

Estimates for week ended:

April 19	105,337	58,565
April 26	102,447	64,559
May 3	107,967	67,060
May 10	105,000	71,355

Just last week suppliers received telegrams from a large manufacturer suggesting a 10 per cent price reduction as of May 3. The wires were given a chilly reception generally but are indicative of the fact manufacturers are moving in on their suppliers for lower prices. The picture here is analogous to that of the public "moving in" on automobile builders for lower prices. As long as demand outruns supply, not much can be done on prices.

One fact not generally realized in contemplating the overall automobile production situation is the important effect of replacement parts production by the industry. One estimate is that the first quarter of this year saw output of \$650 million worth of replacement parts, or 62 per cent beyond last

year's total for the same period, and over four times the volume produced in the first quarter of 1941. If this estimate is correct it runs contrary to earlier predictions by parts companies that this year's level of production would closely parallel that of last year. Talk around the trade is that parts inventories are building up generally, suggesting a tapering of production may not be far off.

Wage Pattern Developing

Everyone of course is watching what may happen on the score of wages in the thousands of plants which have UAW-CIO contracts, following the establishment of the so-called 15-cent increase pattern in the large automobile shops. Many parts manufacturers say they will be unable to meet any such figure and there have been some settlements at around 8 cents an hour increase. It is believed the UAW international union may steer away from any direct orders to locals to demand the 15 cents.

Ford's All-Stars

There is a great interplay of opinions and emotions going on over the sweeping changes which have been effected in the Ford administrative, engineering and purchasing team. Manufacturers' representatives and others who have been calling at the Rouge for years will tell you the company is becoming as badly overstaffed as it was understaffed prior to the war. They tell you the organization is getting so complicated it is becoming difficult to know just who is who. For example, in engineering, a certain program will be mapped out in co-operation with interested suppliers; then a new specialist will be hired and placed in charge of the work. He will throw out all the old plans and announce an entirely new slant of his own. This not only irritates and confuses outsiders who have been consulting on the work, but tends to build up animosity and bitterness in the older Ford personnel.

The new Ford executive team is a beautiful thing to behold as far as names are concerned. It is something like a football team of five Tom Harmons and six Red Granges—all superlative performers in their own field but needing coordination and integration to function as a smoothly operating mechanism. Doubtless this will be achieved at Ford, and perhaps those complaining now are too mindful of the good old days when "there wasn't a college man in the whole Ford purchasing department."

At any rate, the executive retooling at the Rouge is a highly interesting

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FORD POLICYMAKERS: The complete policy committee of the Ford Motor Co. is shown at a recent meeting. With Henry Ford II, president, at the head of the table, the men who formulate the company's policies are, left to right: Benson Ford, a director of the company; D. S. Harder, vice president and director of manufacturing; J. R. Davis, vice president and director of sales and advertising; Albert J. Browning, vice president and

director of purchasing; Ernest R. Breech, executive vice president; Mr. Ford; Mead L. Bricker, vice president and director of the general production division; John S. Bugas, vice president and director of industrial relations; James W. Irwin, assistant to the president and director of public relations; Harold T. Youngren, vice president—engineering; Lewis D. Crusoe, vice president—finance, and William H. Gossett, vice president—counsel

process to watch. It will be proved only when the next series of Ford, Mercury and Lincoln cars appear on the market and when the sales figures are assembled.

GM May Change Bonus Setup

In line with remarks made by Chairman Alfred P. Sloan Jr. in the General Motors annual report concerning the necessity of suitable incentives and rewards for management, GM stockholders now are being asked to vote on a proposal to change the provisions of the corporation's management bonus system, reducing from 7 to 5 per cent the profit that must be earned before distribution of a bonus, and increasing the percentage of the amount over this figure which would be available for a bonus fund. Participation in bonuses also would be widened. Top GM officials took a licking financially last year when no funds were available for bonuses, although this year ample profits should be available to resume the distribution.

Efficiency Improved

Contrasting the old with the new in automobiles, Harold T. Youngren, Ford engineering director, recently told a group of engineers the famous model T engine developed 0.1 horsepower per cubic inch displacement at compression ratio of 4 to 1 while the current V-8 engine develops 0.42 horsepower per

cubic inch at compression ratio of 6.7 to 1, a 400 per cent increase in efficiency. Similarly, engines 25 years ago averaged 10 pounds per horsepower, currently 6.5 pounds per horsepower. The old model T moved 80 pounds weight of car per mile per gallon, while the present V-8 moves 136 pounds. Probably the 1972 model Fords will be moving 500 pounds per mile per milligram of plutonium.

Finds Productivity Down

Some cold and discouraging facts on automobile plant productivity were cited by J. H. Mansfield of Greenless Bros. & Co., Rockford, Ill., in his remarks on multipurpose machines before the Westinghouse Machine Tool Electrification Forum recently. He reviewed the case of a plant which produces a crankcase for one model on a line of so-called transfer-type equipment and another for a different model on a production line made up of individual machines, in which the operators run one or more machines.

The individual machine line had a total of 377 tools and required 24 operators, two tool setters and one-fourth of an electrician's time to keep it in operation. Production before the war was 40 crankcases an hour. Now, with the same number of men difficulty is encountered in maintaining 30 per hour.

The transfer line had 428 tools, 14

per cent more than on the other line, required 12 operators, three tool setters and half an electrician's time. Production before the war with the same manpower was 52 pieces per hour; now there is trouble in maintaining 45 an hour.

Part of the reduction must be blamed on poor quality of gray iron castings, resulting in tool breakage, shutdowns, scrap and other delays. The balance, however, must be blamed on inefficiency and lack of interest on the part of the operators. An interesting deduction noted by Mr. Mansfield is that the drop in production is in the ratio of 52:45 per hour or 87 per cent for the transfer machines, and from 40:30 per hour or 75 per cent on the individual machine line, suggesting that the nearer automatic a production line can be made, the easier it becomes to maintain efficiency.

K-F Total Near 40,000

Although still presumably operating in red ink, Kaiser-Frazer Corp. is pointing with pride to the fact from Jan. 1 through April 19 it had built more cars than DeSoto, Cadillac, Packard, Willys, or Lincoln—23,690 in all. Total built since the start of production last year is now close to 40,000. Special shipping crews have been working week-ends to move cars, and assembly line crews have been putting in some Saturday work.



Speaking
of
DIVES!

Try CIMCOOL, and just watch your metal cutting costs

YOU'LL FIND this amazing new cutting fluid—this *chemical emulsion*, will save you money in your shop not one way, but *two* ways:

1. CIMCOOL COSTS LESS. It compares favorably in price with old-fashioned coolants, but that's only the beginning. Cimcool lasts longer. Being a chemical emulsion, it isn't subject to the bacterial action which breaks down ordinary oils and emulsions so quickly. And its low surface tension and non-adhesion to chips and work virtually eliminate carry off.

2. TOOLS COST LESS. Plant after plant reports increase in tool and wheel life of 50 percent — 100 percent — even 200 percent after switching to Cimcool; for this revolutionary new kind of cutting

fluid combines friction reduction and cooling capacity in a degree never before attained. May we show you the evidence?

OTHER CIMCOOL ADVANTAGES

- Faster cooling allows faster cutting.
- Uniform work temperature increases accuracy.
- No fire hazard — No smoke — No slippery film.
- No chromates or other skin irritants.
- Contains long-lasting rust inhibitor.
- Covers 85% of all metal working jobs.

CIMCOOL

THE
MULTI-PURPOSE
CUTTING FLUID

Trade Mark Reg. U. S. Pat. Off.

CIMCOOL DIVISION of THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U. S. A.

C.F.&I. Plans To Modernize, Expand Plants

Extensive modernization remains to be done. Rod and billet mills and other facilities under consideration

THE Colorado Fuel & Iron Corp., Denver, is planning further expansion and modernization of its plants under the direction of its aggressive new president, Carl W. Meyers, who came to the company from the Republic Steel Corp. in September, 1946.

During the war, Colorado Fuel & Iron built with its own funds ore bedding facilities, a sintering plant and a 750-ton blast furnace at Pueblo, Colo., where it now has four blast furnaces, 266 coke ovens, 16 open-hearth furnaces, plus facilities for producing shapes, bars, rails, rail fastenings, wire and related products, grinding balls and other specialty products. The company also financed improvements to its iron ore mine at Sunrise, Wyoming. Seventy-two of the coke ovens were built by the Defense Plant Corp. and purchased recently, along with a steam plant, for \$2,750,000. Rocky Mountain Arsenal, Denver, producing chlorine and caustic soda, has been operated under a lease arrangement since February.

Wickwire Division Modernizes

The Wickwire Spencer Division, acquired through merger in October, 1945, purchased new wire drawing equipment during the war for its Buffalo and Clinton, Mass., plants and wire rope stranding machines for the Palmer, Mass., plant.

Following an inspection of East and West Coast plants, as well as those in Colorado, Mr. Meyers told STEEL: "While a considerable amount of money has been spent in the past several years to improve the plants, surveys show that additional large sums still need to be expended to complete the program.

"At the Pueblo plant, for example, we are considering the construction of a new rod mill, additional wire drawing and galvanizing facilities and possibly a new billet mill and other facilities.

"Additional wire drawing equipment, wire rope stranding machines and other improvements will be added to complete the job started at our Wickwire plants. The Oakland and South San Francisco, Calif., plants of our subsidiary, the California Wire Cloth Co., also need additional machinery and equipment."



NEW MILL DEPOT: Bethlehem Steel Co.'s new mill depot for tool and special steels has been opened at company's Bethlehem, Pa., plant. Designed to speed up deliveries, the depot provides rapid service to distributors, jobbers and mill customers, permitting them to replace suddenly depleted sizes and to keep their own stocks at a minimum

The sales organization of the Colorado and Wickwire Divisions and the California subsidiary have been expanded and sales efforts integrated. N. H. Orr, vice president, formerly in charge of railroad sales, now heads up all sales for the entire corporation including steel, fuel and chemicals. W. S. Boyce has been named general manager of Railroad Sales for the corporation. F. S. Jones has been appointed general manager of Commercial Sales of the Western Division.

Operations of all company plants now are under the direction of A. F. Franz, vice president in charge of operations. Mr. Franz previously was associated with the Alan Wood Steel Co., Conshohocken, Pa. Jay J. Martin, formerly open-hearth superintendent, has been named works manager at the Pueblo plant. Rudy Smith has been elevated from assistant open-hearth superintendent to superintendent. H. H. Christy has been appointed superintendent of the Power and Water Depts. Robert R. Williams Jr., formerly assistant blast furnace superintendent, has replaced Harvey W. Linhardt, retired. D. S. Muckley has retired as rolling mill superintendent and has been replaced by W. B. Jacobson, formerly assistant superintendent. J. S. Black has been named superintendent of the Buffalo plant. J. S. Hawley has been appointed manager of the California Wire Cloth Corp., succeeding S. C. Pohlman, vice president and general manager.

L. C. Rose continues as director of purchases for Colorado with W. T. Stratton heading up buying for the Wickwire Division.

Seaver Firm Contracts To Dismantle Tennessee Plant

Tennessee Products Corp., Nashville,

Tenn., has awarded a contract to Jay J. Seaver Engineers, Chicago, to engineer and supervise the work of dismantling the stoves, mains and stack of the Tennessee company's plant at Rockdale, Tenn. The Chicago firm will move and re-erect the equipment at Lyles, Tenn. Jay J. Seaver has also contracted to rehabilitate the company's Rockwood, Tenn., plant with the installation of a turboblower, gas cleaning equipment and tubular brick inserts in the hot blast stoves.

Writes Book on Trust Laws As Applied to Foreign Trade

How American business firms can consolidate their facilities and organizations to meet foreign trade competition without violation of the anti-trust laws is explained and documented in a new book, *International Contracts and the Anti-Trust Laws*, by Harry Aubrey Toulmin Jr., of the Bar of the Supreme Court of the United States and president of Hydraulic Press Mfg. Co., Mt. Gilead, O.

Included in the book's 1068 pages are typical forms of agreements, indictments, complaints and decrees, together with the full text of all related anti-trust laws.

Industrial Expansion Totals \$31.5 Million in Chicago

Chicago area industrial developments in April, consisting of new construction, plant expansion and purchases of buildings and land for industrial purposes, amounted to \$31,517,000. According to the Chicago Association of Commerce and Industry, this compares with \$13,089,000 in March, 1947, and \$12,578,000 in April, 1946.

B R I E F S

Paragraph mentions of developments of interest and significance within the metalworking industry

Pratt & Whitney Aircraft Division, East Hartford, Conn., United Aircraft Corp., built 37 per cent of the total dollar value of aircraft engines exported by United States manufacturers during 1946.

—o—

Tennessee Coal, Iron & Railroad Co., Birmingham, recently presented 115 of its employees with service certificates recognizing their long employment.

—o—

War Assets Administration has announced its acceptance of a \$2 million bid by Electric Auto-Lite Co., Toledo, O., for the surplus government-owned propeller plant in Westover, N. Y.

—o—

Siewek Tool Co., Detroit, has appointed Colby Rowell Co., Minneapolis, as Minnesota distributor for the firm's lines of drill jigs, fixture clamps and fixture details.

—o—

Minneapolis-Honeywell Regulator Co., Minneapolis, manufacturer of industrial instruments, has opened an office in Butte, Mont., with James A. Reynolds in charge.

—o—

American Standards Association, New York, has announced a five-day seminar on the organization and technique of industrial standardization which will be open to interested parties June 23 to 27. Dr. John Gaillard, mechanical standards engineer and lecturer at Columbia University, is in charge.

—o—

Monsanto Chemical Co., St. Louis, has appropriated \$500,000 for relief among its employee victims of the Texas City disaster. Benefits to be paid from this sum are over and above all the company's legal liabilities, which are fully covered by insurance.

—o—

Peterbilt Motors Co., Oakland, Calif., has been purchased from the estate of the late T. A. Peterman by a group of operating personnel of the company headed by L. A. Lundstrom, president and general manager.

—o—

Hy-Alloy Steels Co., Chicago, warehouse firm, has opened an office at 618 Fisher Bldg., Detroit.

—o—

Cooper Bessemer Corp., Mt. Vernon, O., is building what it terms the largest gas engine-driven angle compressor in the world. Panhandle Eastern Pipeline

Co. has ordered five of the units, the first to be installed in its Pleasant Hill, Ill., station by June 1.

—o—

R. D. Fageol Co., Detroit, manufacturer of engine air inlets for busses and trucks, has established a research department to further the development of additional products.

—o—

Sage Equipment Co., Buffalo, newly organized, has acquired facilities for production of casters, hand trucks, gravity wheel conveyors and portable power boosters.

—o—

Westinghouse Electric Corp., Pittsburgh, is offering a basic sound slide course on radio frequency heating to plant engineers, metallurgists and technicians in heating fields. Offered in a series of eight 2-hour sessions, lectures cover such metalworking applications as soldering, brazing, annealing and hardening by induction heating.

—o—

Star Iron & Steel Co., Tacoma, Wash., has received a contract for a 325-ton gantry crane for the Davis power plant at the Davis Dam on the Colorado river between Arizona and Nevada, Bureau of Reclamation has announced. To cost \$318,264, the crane is to be of the double-trolley, motor-operated type.

—o—

War Assets Administration has declined as inadequate all bids received for purchase of portions of two California aircraft plants consisting of a San Diego installation leased and operated during the war by Consolidated Vultee Aircraft Corp. and a Chula Vista facility formerly operated by Rohr Aircraft Corp. These facilities originally cost the government over \$10 million.

—o—

Buick Motor Division, Flint, Mich., General Motors Corp., produced 24,496 cars in April, largest postwar monthly volume yet achieved. Total 1947 model output to date is 82,070.

—o—

Forbes Steel Corp., Pittsburgh, has acquired the plant of Canonsburg Steel & Iron Works, Canonsburg, Pa., and will use the facility as a warehouse. Situated on 20 acres of land, the plant has approximately 300,000 sq ft of area.

—o—

Bureau of Mines, Washington, Department of the Interior, has released "This Is Aluminum," a sound motion picture

describing production of this metal from raw ore to finished materials. The film is available for showing to educational groups, and business and civic clubs.

—o—

Vascoloy-Ramet Corp., North Chicago, Ill., has appointed the following sales and service representatives: B. J. Naden, Cleveland; J. M. Kinney, Toledo, O.; Frank Schoffler, Kansas City, Mo.; and Dean R. Cline, Chicago.

—o—

Selenium Corp. of America, affiliate of Vickers Inc., has moved to new headquarters at El Segundo, Calif., where the corporation's line of power and instrument rectifiers and self-generating, photoelectric cells are manufactured.

—o—

Carnegie-Illinois Steel Corp., Chicago, will hold open house in its South Chicago, Ill., plant May 14 and in its Gary, Ind., works May 14 and 15.

—o—

Structural Steel & Forge Co., Salt Lake City, Utah, was high bidder at \$81,400 for the surplus government-owned vanadium plant at Salt Lake City. The company will use the facility, which consists of two manufacturing buildings, a laboratory, an office building, a warehouse and two smaller buildings, for production of steel products for the construction industry.

—o—

Electric Steel Foundry Co., Portland, Oreg., has started a profit-sharing plan which will give its workers one-third of net profits after deduction of taxes. Of the amount paid to employees, the majority will go into a bonus fund, with a small portion set aside for welfare purposes.

—o—

Linde Air Products Co., New York, unit of Union Carbide & Carbon Corp., is building a new oxygen filling station and acetylene-producing plant at Stockton, Calif. The project is expected to be completed in late summer.

—o—

National Electrical Manufacturers Association, New York, has announced a second revision of its motor and generator standards, publication No. 45-102. Standards of particular interest cover the "D" flange, the resistance method of temperature determination, integral-horsepower hermetic motors and small-power motors for special applications.

—o—

Taylorcraft Inc., a dealer-owned cooperative formed recently, contemplates moving from Alliance, O., to Columbus, O., to manufacture planes under the old Taylorcraft Aviation Corp. trade name. Group recently purchased the trade name, good will and some jigs and dies of the old firm.

The Business Trend

Production Continues at High and Steady Rate

HIGH LEVEL industrial production is being maintained but businessmen are becoming increasingly reserved with respect to plans and commitments for the future. This exercise of restraint reflects increasing uncertainty as to the outlook for business in the future. Tremendous desire exists for nearly all commodities, however, the only factor governing the extent to which this desire will be transformed into demand being relationship of prices to income.

The continuation of high level industrial activity through the week ended May 3 put STEEL's industrial production index at 161 per cent of the 1936-1939 average. In the preceding week the index had been 162 per cent, only 2 points below the postwar peak.

STEEL—While steel ingot output continues high it recently has suffered somewhat from effects of work stoppages accompanying delays in the reaching of agreements between the steelworkers' union and several important producers. Although the ingot production rate in the week ended May 3 was at 94 per cent of capacity it was the lowest since the week ended Mar. 8.

AUTOS—Second highest weekly production of automobiles since the war was recorded in the week ended May 3, the estimated output of passenger cars, trucks and busses being 107,967 units. The postwar record is 108,-

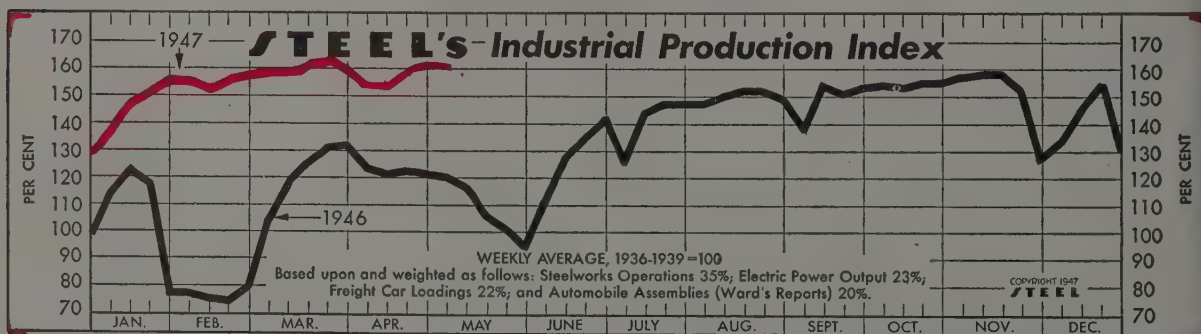
472 manufactured in the week ended Mar. 22.

COAL—Output of bituminous coal continued to climb, the estimate for the week ended Apr. 26 being 12,670,000 net tons, compared with 12,600,000 in the preceding week. Production this year through Apr. 26 is 21.2 per cent ahead of that for the corresponding period of last year.

PRICES—For the fourth consecutive week the wholesale price index of the U. S. Bureau of Labor Statistics declined, lowering the index for the week ended Apr. 26 to 146.8 per cent of the 1926 average. In the preceding week it had been 147.2 per cent. Postwar peak was 149.4 per cent in the week ended Mar. 29, after which the index began the decline which is yet unbroken.

CONSTRUCTION—A drop from the high volume of construction indicated early this year is reported by F. W. Dodge Corp., New York, which ascribed the decline to a rapid rise in costs in the last six months. Studying data from project contracts awarded in the 37 states east of the Rocky mountains, the company found contract volume was at a rate of only \$24 million per business day during the first three weeks of April, compared with \$28 million in March and \$33 million in April, 1946. The decline is general, affecting nonresidential building, residential building and heavy engineering construction.

EMPLOYMENT—Factory employment which had been rising since February, 1946, leveled off in March, 1947, according to the U. S. Department of Labor, the department's factory employment figure for March being unchanged from February's postwar peak of 15,481,000 employees.



The Index (see chart above): Latest Week (preliminary) 161 Previous Week 162 Month Ago 156 Year Ago 120

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	94.0	95.5	97.0	64.5
Electric Power Distributed (million kilowatt hours)	4,640	4,668	4,693	4,012
Bituminous Coal Production (daily av.—1000 tons)	2,112	2,100	2,025	137
Petroleum Production (daily av.—1000 bbl.)	4,951	4,930	4,892	4,721
Construction Volume (ENR—Unit \$1,000,000)	\$102.5	\$88.4	\$130.8	\$108.8
Automobile and Truck Output (Ward's—number units)	107,967	102,447	97,385	67,060

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

TRADE

Freight Carloadings (unit—1000 cars)	875†	894	715	671
Business Failures (Dun & Bradstreet, number)	70	66	71	23
Money in Circulation (in millions of dollars)†	\$28,118	\$28,105	\$28,247	\$27,888
Department Store Sales (change from like wk. a yr. ago)†	+14%	-6%	+10%	+26%

† Preliminary. ‡ Federal Reserve Board.

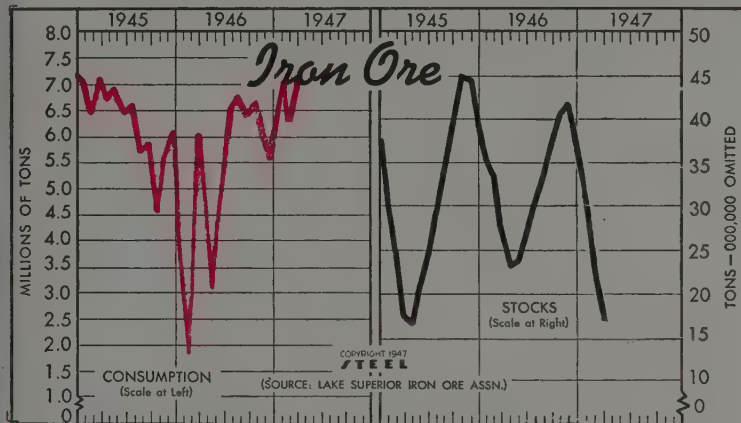
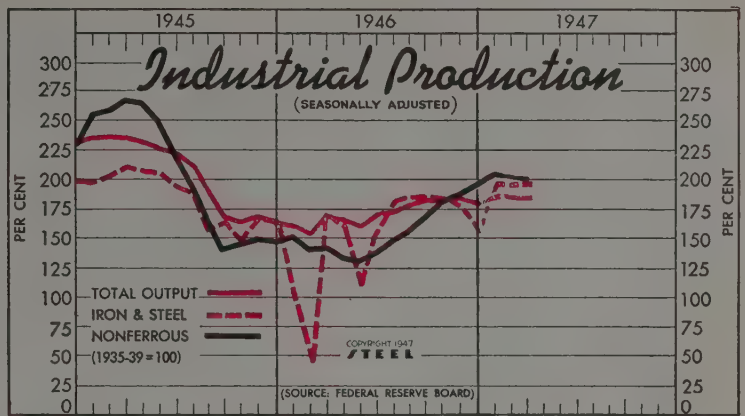
Federal Reserve Board's
Production Indexes

(1935-39=100)

Total

Production Iron, Steel Nonferrous
1947 1946 1947 1946 1947 1946

Jan.	188	160	192	102	203	150
Feb.	189	152	191	43	203	141
Mar.	189	168	194	169	200	139
Apr. ....	...	165	...	159	...	132
May ....	...	159	...	109	...	128
June ....	...	170	...	154	...	137
July ....	...	172	...	180	...	151
Aug. ....	...	177	...	184	...	159
Sept. ....	...	179	...	185	...	172
Oct. ....	...	181	...	184	...	184
Nov. ....	...	183	...	178	...	192
Dec. ....	...	182	...	159	...	197
Ave. ....	...	171	...	150	...	157

Iron Ore
(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and furnaces	
	1947	1946	1947	1946
Jan.	7,024	3,719	30,514	35,342
Feb.	6,264	1,748	24,317	33,647
Mar.	6,979	6,021	17,411	27,601
Apr. ....	...	4,769	...	23,079
May ....	...	2,990	...	23,905
June ....	...	4,995	...	26,265
July ....	...	6,460	...	30,439
Aug. ....	...	6,738	...	34,067
Sept. ....	...	6,380	...	37,573
Oct. ....	...	6,625	...	40,435
Nov. ....	...	6,131	...	41,919
Dec. ....	...	5,516	...	37,465
Total .....	...	62,093	...	...

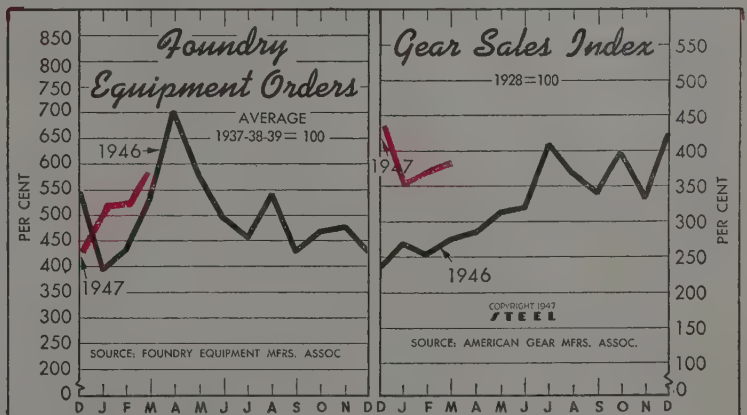
Foundry

Equipment Orders

Gear Sales

Index—
(1937-38-39=100)

	1947	1946	1945	1947	1946	1945
Jan.	513.4	392.8	422.4	350	269	323
Feb.	521.9	432.8	465.3	376	253	331
Mar.	573.8	536.6	604.7	380	275	339
Apr. ....	...	701.2	325.0	...	284	296
May ....	...	577.8	404.7	...	313	309
June ....	...	491.7	375.4	...	321	271
July ....	...	453.4	411.7	...	407	264
Aug. ....	...	538.7	532.2	...	368	205
Sept. ....	...	424.4	577.2	...	342	213
Oct. ....	...	469.2	457.8	...	397	251
Nov. ....	...	477.4	416.6	...	336	255
Dec. ....	...	430.9	547.6	...	425	239
Ave. ....	...	493.9	461.7	...	332	275



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$11,213	\$12,442	\$14,254	\$12,418
Federal Gross Debt (billions)	\$257.9	\$257.9	\$257.9	\$272.9
Bond Volume, NYSE (millions)	\$18.8	\$18.0	\$13.0	\$34.4
Stocks Sales, NYSE (thousands)	4,329	4,380	3,120	5,446
Loans and Investments (billions)†	\$55.2	\$55.3	\$55.2	\$65.3
United States Gov't. Obligations Held (millions)†	\$34,865	\$34,814	\$34,695	\$46,935

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	\$69.82	\$69.82	\$69.82	\$63.54
All Commodities†	146.8	147.2	149.4	109.6
Industrial Raw Materials†	161.3	160.3	165.5	123.0
Manufactured Products†	141.1	142.1	143.3	105.1

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry



J. LESTER PERRY

J. Lester Perry has been elected president of the Columbia Steel Co., West Coast subsidiary of United States Steel Corp., New York. He succeeds the late William A. Ross. Mr. Perry has been assistant to the president of the United States Steel Corp. of Delaware, and formerly was president of the Carnegie-Illinois Steel Corp.

—O—

George P. F. Smith has been elected a vice president of Borg-Warner Corp., Chicago. He is president of Marbon Corp., a Borg-Warner subsidiary.

—O—

Russell B. Barnett and William S. Hernon have been elected to the board of directors of Peter A. Frasse & Co. Inc., New York. Mr. Barnett is vice president in charge of sales for the firm. Mr. Hernon is chairman of the executive committee of Ritter Co. Inc., Rochester, N. Y.

—O—

George B. Parker, former administrative assistant to the sales vice president, United States Steel Supply Co., subsidiary, U. S. Steel Corp., has been appointed general staff manager of the sales department. Linus E. Olson, staff assistant to the sales vice president, has been promoted to manager of the Advertising Division, and William A. Crane has been made manager of the Commercial Research Division.

—O—

Paul J. Maddox, assistant vice president, Laclede-Christy Clay Products Co., St. Louis, has been appointed general sales manager of the Refractories Division of the company.

—O—

Henry C. L. Johnson has been appointed advertising manager of Rheem Mfg. Co., San Francisco, and Carlton A. Johanson, who has been manager of pub-



TOM J. SMITH JR.

lic relations and advertising for the company, has resigned to open an office in San Francisco to engage in public relations and industrial consulting.

—O—

Tom J. Smith Jr. has been elected president of Pressed Metal Institute, Cleveland. He has been executive vice president of the institute.

—O—

All American Industries Inc., New York, announces that Comdr. John Metcalfe, USNR, has been named general manager of all operations of the Fitz-Simons Steel Inc., Youngstown, O., one of its subsidiaries.

—O—

W. W. Brown has been named to head the new Cold Drawn Bar Sales Division, Youngstown Sheet & Tube Co., Youngstown. He will also continue as manager of sales of hot rolled carbon bars. W. J. MacKenzie has been named to head the new Carbon Bar and Semi-Finished Division in Chicago. Mr. MacKenzie will also continue as manager of alloy sales. L. V. Kuhnle has been appointed manager of rod and wire sales, and H. H. Smith has been appointed manager of high strength (Yoloy) sales.

—O—

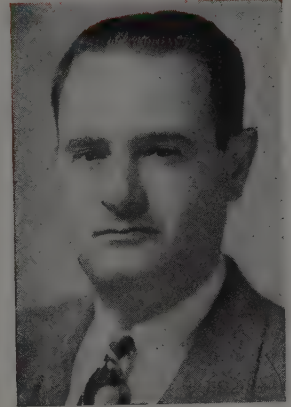
John G. Phillips has been elected a vice president and treasurer of International Business Machines Corp., New York. Harrison K. Chauncey has been named secretary, and Fred H. Frick, assistant secretary.

—O—

David D. Cooper has been named assistant to the president of Portsmouth Steel Corp., Portsmouth, O. He formerly had been chief industrial engineer, Republic Steel Corp., at Youngstown.

—O—

Douglas M. Lyon has been appointed sales manager, Porter-Cable Machine Co.,



LEO A. WISE

Syracuse, N. Y. He succeeds Harvey L. Ramsay, who has been appointed vice president in charge of merchandising.

—O—

Leo A. Wise has been appointed purchasing agent, American Safety Razor Corp., Brooklyn, N. Y. He has been assistant purchasing agent.

—O—

Henry F. Griswold has been appointed works manager for the Jacobsen Mfg. Co., Racine, Wis. He previously had been connected with the J. I. Case Co., Racine, for 25 years.

—O—

Eugene C. Bauer Jr. has been elected a vice president, Kensington Steel Co., Chicago.

—O—

Herman J. Spoerer, supervisor of industrial relations, Chicago district, Youngstown Sheet & Tube Co., has been appointed director of industrial relations for the entire company, with headquarters at the general offices in Youngstown.

—O—

Richard E. Roberts has joined Ford Motor Co., Dearborn, Mich., as director of its community relations department. He has been associated with the Fisher Body Division, General Motors Corp., Detroit.

—O—

George H. Deike has been elected a director of Follansbee Steel Corp., Pittsburgh, to succeed J. H. McCoy, who has resigned. Mr. Deike is president of Mine Safety Appliances Co., Pittsburgh.

—O—

John A. Vaughan, chief engineer, W. L. Maxson Corp., New York, has been elected vice president in charge of engineering and also a director of the company. He succeeds the late Peter J. McLaren in these positions.

—O—

Arthur H. Babin has been named re-



YOU CAN TEAR IT WITH YOUR FINGERS...

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If you can improve your products with "tissue-thin" strip steel you'll want to consider the many remarkable properties of ARMCO Thin-Gage Stainless Steels.

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MANY ADVANTAGES

Along with high strength/weight ratio you get excellent corrosion resistance and attractive appearance. To your production line it brings all the cost-saving advantages of coils — no hand-feeding, relatively no end-of-strip scrap losses, and faster production.

A war-born development of Armco Research, this chromium-nickel stainless steel strip is rolled as thin as .001,

in coils *up to 13 inches wide*. Its gage-uniformity is remarkable. There is no "crown" in the center.

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Just fill in the coupon for more information about ARMCO Thin-Gage Stainless Steel. The American Rolling Mill Company, 2211 Curtis Street, Middletown, Ohio.

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**The American
Rolling Mill Company**

gional manager for Kaiser-Frazer Corp., Willow Run, Mich. He was formerly the company's regional manager at Washington and at Pittsburgh.

Lester O. Stearns has joined York-Shipley Inc., York, Pa., as manager of the Residential Division. He had been previously owner and director of Stearns Supply Co., Cleveland.

Harold H. Jaeger has been appointed director of advertising of the Can Manufacturers Institute, New York, succeeding **Gordon E. Cole**.

J. B. Misenhimer has been named manager of sales, American Can Co., in Canada. He will maintain headquarters at Hamilton, Ont.

Richard R. Eppley has been appointed superintendent of the Brier Hill coke plant, Youngstown Sheet & Tube Co., Youngstown. He succeeds the late **Emil F. Vogel**.

Alice H. Drew, advertising manager of TelAutograph Corp., New York, has been retained as advertising consultant for Holtzer-Cabot Division, First Industrial Corp., Boston. She will continue her work with TelAutograph Corp.

Professors E. R. Queer and **E. R. McLaughlin**, Pennsylvania State College, have been retained by Pittsburgh Lectrodryer Corp., Pittsburgh, as consulting engineers.

Herman A. Grishkat has been appointed district manager in northern New York state and in Berkshire county, Mass., for the Federal Machine & Welder Co., Warren, O.

E. D. Cowlin has been appointed general manager, Reliance Division, at Massillon, O., for the Eaton Mfg. Co., Cleveland.

Ray E. Fisher Jr., Bonney-Floyd Co., Columbus, O., is visiting and working in the iron and steel foundries of the United Kingdom and the European continent. He will return to the United States late this summer.

Walter J. Cooper, former head of the business management department, western region, Ford Motor Co., Dearborn, Mich., has been named assistant regional manager for that area.

Olaf Haug has been named automotive representative in continental Europe and Scandinavia for Borg-Warner International Corp., Chicago. He was formerly

European representative for Carter Carburetor Corp., subsidiary of American Car & Foundry Co., New York.

D. J. Van Dyke has been appointed manager of the Detroit district sales office, Hy-Alloy Steels Co., Chicago. He was formerly associated with Chevrolet Division, General Motor Corp., and the Continental Motors Corp., Detroit.

Ray M. Scott Jr. has been named to head the new factory sales and service branch of Towmotor fork lift trucks, Towmotor Corp., in Camden, N. J.

Charles V. Cole has been appointed works manager, National Motor Bearing Co. Inc., in the Redwood City, Calif., plant.

Ernest R. and William F. Sternberg have been elected vice presidents of Sterling Motor Truck Co., Milwaukee, in charge of engineering and of production.

William J. Grede, president, Grede Foundries Inc., Milwaukee, has been elected as class B director of the Federal Reserve Bank of Chicago.

Charles A. Richardson has been promoted to assistant manager of machinery sales, United Engineering & Foundry Co., Pittsburgh.

Earl A. Tanner and **Robert C. Ross** have been elected directors of the Inland Steel Co., Chicago. Mr. Tanner is president of two Inland Steel subsidiaries, Milcor Steel Co. and Inland Steel Container Co. Mr. Ross has been vice president and a director of Joseph T. Ryerson & Son Inc., subsidiary of Inland Steel Corp.

James A. Reynolds has been named

branch manager of the new Minneapolis-Honeywell Regulator Co. office, Butte, Mont.

William P. Drake, manager of sales, Special Chemicals Division, Pennsylvania Salt Mfg. Co., Philadelphia, has been appointed assistant vice president of the company.

W. T. McCurdy has been appointed district manager, Mack Trucks Inc., New York. His territory will comprise Tennessee and Arkansas.

Paul L. Reed has been appointed zone manager in Ohio for the Process Equipment Division, Castaloy Corp., Detroit.

G. Thomas Muehlenkamp, metallurgist, has been named to the staff of the Battelle Memorial Institute, Columbus, O.

W. A. Seifert, senior partner of the law firm of Reed, Smith, Shaw & McClay, Pittsburgh, has been elected a director of the Latrobe Electric Steel Co., Latrobe, Pa. He succeeds **F. B. McFeely**, resigned. Other directors elected are **C. E. Anderson**, **D. J. Giles**, **A. Stanley Miller**, **A. M. Morgan**, **H. S. Saxman** and **M. W. Saxman Jr.** **J. E. Workman** has been elected vice president in charge of sales for the company, and **G. D. Billock**, formerly associated with National Steel Corp., Pittsburgh, has been elected assistant treasurer.

Oliver H. Clark, executive engineer, Chrysler Corp., Detroit, has retired after 22 years' association with the company. He joined the Engineering Division of Chrysler at its inception in 1925, and after 10 years as chief body engineer was appointed executive engineer.

Josiah B. Rutter, director of the general engineering department, Monsanto

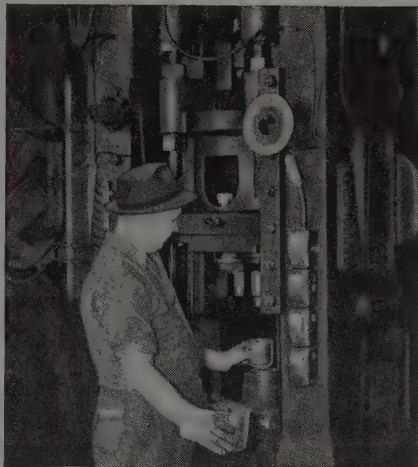
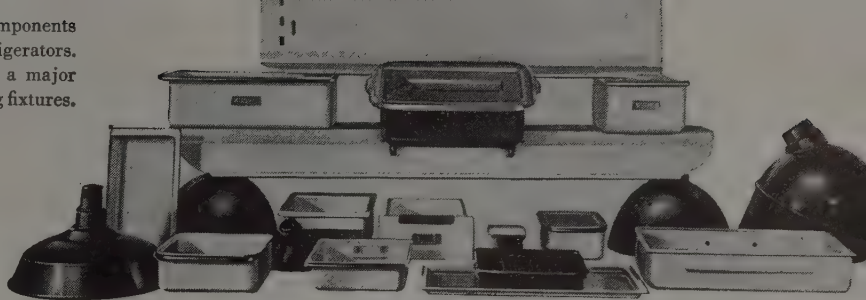


EARL A. TANNER



ROBERT C. ROSS

Strong produces 85% of the enameled components used by 5 major manufacturers of refrigerators. Also shown are enameled reflectors for a major line of home, industrial and arena lighting fixtures.



For routine deep-drawing in light and medium gauges, Strong prefers Bliss double-action toggle presses because of their accessibility and speed. Toggle presses are particularly effective for rapid drawing of small-diameter shells in one or more operations.

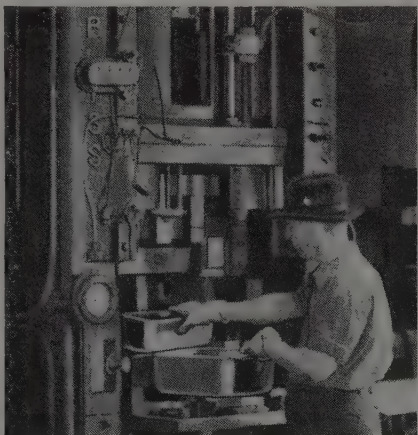
HERE'S DEEP-DRAWN VARIETY

Why Bliss Engineers Recommend Both Mechanical and Hydraulic Presses For Wide-range Drawing

Scrap loss, down time, set-up time—these are the plus or minus signs of production arithmetic.

Even if your products are special and few, selection of *complete* drawing equipment is an important factor in keeping costs down, production at peak levels. And for the jobbing shop, producing a wide variety of short-run items, flexible drawing facilities are an absolute "must" to maintain the profit-margin on *all* competitive bids.

The Strong Manufacturing Company of Sebring, Ohio,—one of the nation's leading sub-contractors for enameled deep-drawings—has overcome the problems of product-variety and short-runs by equipping its shop with *both* Mechanical and Hydraulic drawing presses. These captioned photographs show how Strong attains the greatest possible utility by using both types of Bliss presses.



Strong prefers Bliss Hydro-Dynamic presses for safe and effortless deep-drawing of large-area items from stock of non-uniform thickness and temper. Here, at left, is a refrigerator vegetable pan, being deep-drawn in one operation on a 75-35 ton Bliss hydraulic press. The first try-out stroke of this new press produced a perfect piece, and the initial run of 10,000 pieces resulted in only 4 rejects! At right, a 250-125 ton hydraulic produces insets for large electric roasters, using only 40 tons blankholding pressure for a wrinkle-free draw.



Variety again pays off in such unusual second operations as the swedging of work-hardened material, illustrated above. The grooves are deep with small bottom radii. A double-action Bliss hydraulic press provides the uniform speed and constant blankholding pressure that mean few rejects, long life for expensive dies. Interchangeable tools permit emergency scheduling of rush jobs to the more available Mechanical or Hydraulic machine.

Here, then, is a perfect example of partnership between press and user, in which the inherent skill and versatility of each contribute to superior performance. You can enjoy similar efficiency by calling on Bliss. 90 years of experience in press engineering and on those unbiased recommendations which only the manufacturer of Mechanical and Hydraulic presses can make.

E. W. BLISS COMPANY, DETROIT 2, MICHIGAN

Mechanical and Hydraulic Presses, Rolling Mills, Can and Container Machinery
WORKS AT: Brooklyn, N. Y.; Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Derby, England; St. Ouen sur Seine, France • SALES OFFICES: Detroit; Brooklyn; Cleveland, Dayton, Toledo, Ohio; Lansing, Mich.; Chicago; Philadelphia, Pittsburgh, Pa.; Rochester; New Haven; Boston; Toronto.

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY

STAY AHEAD
WITH Bliss

Chemical Co., St. Louis, has been appointed general manager of the company's Merrimac Division to succeed Daniel S. Dinsmoor, who has resigned. Mr. Dinsmoor was also vice president of Monsanto. Mr. Rutter is succeeded in his former position by **Fred C. Grone-meyer**.

F. A. Abbiati, general manager of sales, Monsanto Chemical Co., St. Louis, in the company's Plastics Division, has been appointed assistant general manager of the division. He is succeeded by **James R. Turnbull**, who has been assistant general manager of sales in the division, and who, in turn, is succeeded by **Charles Lichtenberg**.

Boyd O. Bach has been appointed manager of sales, fabricated steel construction, Bethlehem Steel Co., Bethlehem, Pa. He succeeds **Charles A. Johnson**, who is retiring.

William L. Melcher, product service supervisor, A. O. Smith Corp., Milwaukee, has been transferred to New Orleans to head the company's water heater and conversion burner sales in Louisiana and Arkansas.

Joseph E. Bodoh has been appointed chief electrical engineer of the Gary, Ind., plant of Carnegie-Illinois Steel Corp.

Eugene C. Stewart has been appointed assistant manager, Kensington Works, General Electric Co., Schenectady, N. Y.

Frank J. Hoenigsmann, executive vice president of the Florence Stove Co., Chicago, has been elected first vice president, Gas Appliance Manufacturers Association.

Stuart E. Sinclair has been appointed chief metallurgist, Greenfield Tap & Die Corp., Greenfield, Mass. He was formerly connected with the Geometric Tool Co., New Haven, Conn.

William A. Anderson has retired as sales representative in Buffalo for Hercules Powder Co., Wilmington, Del.

Harvey Gaylord, assistant treasurer, Bell Aircraft Corp., Niagara Falls, N. Y., has been appointed treasurer of the company.

G. H. Latham has been appointed president, British Iron & Steel Research Association, England. He succeeds **Sir James Lithgow**, the first president, who had been elected in 1945. Mr. Latham, president-elect of the British Iron & Steel Federation, is chairman and managing

director of the Whitehead Iron & Steel Co. Ltd., Newport, Eng.

R. M. Darrin has been appointed assistant district manager, Central Station Division, New York district, for General Electric Co., Schenectady, N. Y., and **Horace A. Davis** has been appointed district manager, New York district, of the company's Transportation Division. He succeeds Mr. Darrin.

Justus W. Lehr has been appointed district manager in charge of the Berwick, Pa., plant of American Car & Foundry Co., New York. He succeeds **Guy C. Beishline**, resigned.

E. D. Haugh has been made district traffic manager, Chicago, Bethlehem Steel Co. He had been traffic manager in the Tulsa, Okla., district.

John Gulick, has been appointed Chicago office manager of Borg-Warner International Corp., Chicago. He had been administrative assistant in the Engineering Division, Boeing Aircraft Co., Seattle, during the war.

E. J. Parker and **R. H. Sjöberg** have been elected vice presidents of the ACF-Brill Motors Co., Philadelphia. Mr. Parker will be in charge of manufacturing.

A. N. Phillips has been elected vice president of the fourth district of the National Association of Purchasing Agents. He is purchasing agent for the Schwitzer-Cummings Co., Indianapolis.

The following directors and officers have been elected by the North American Refractories Co., Cleveland: Directors, **W. G. Bauer**, **F. H. Deal**, **E. F. Hayes**, **J. E. Hindman**, **H. H. Hopwood**, **J. H. McNeerney**, **J. D. Ramsay**, **K. G. Seaton**, **W. N. Sleicher**, **H. E. Stuhler**, **E. W. Valensi**, and **E. M. Weinfurtnr**. Messrs. Hopwood, Ramsay, Stuhler, Valensi and Weinfurtnr are members of the executive committee. The officers elected are: **J. D. Ramsay**, chairman of the board; **E. M. Weinfurtnr**, president; **H. E. Stuhler**, first vice president and treasurer; **H. H. Hopwood**, vice president in charge of sales; and **E. W. Valensi**, secretary and comptroller.

Anthony M. Kohler and **Alan E. Phin** have been elected vice presidents of Babcock & Wilcox Co., New York. Mr. Kohler has been general manager of the Refractories Division, and Mr. Phin, controller of the company.

W. T. Fink, president, Form Products Co. Inc., Minneapolis, has been appointed

distributor in the Minnesota area of Vascoloy-Ramet Corp., North Chicago. **George Jalma**, service engineer and factory representative of the corporation, will assist Mr. Fink.

Frank W. Sutton, industrial engineer, has resumed private practice with headquarters in Los Angeles, and affiliated offices in San Francisco, New York and Chicago. He served Army Ordnance Dept. and many war contractors in the same capacity during the war.

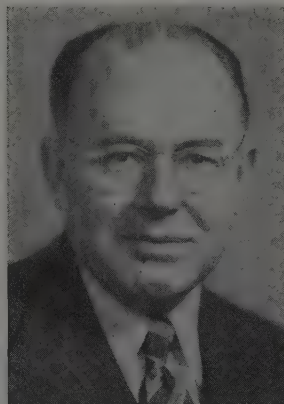
Paul Conant has been appointed field service representative in Hudson, Bergen, Passaic and Morris counties in New Jersey for Optimus Detergents Co., Matawan, N. J.

Joseph Cohan has been named general manager of the New York branch of Philco Distributors Inc., subsidiary of Philco Corp., Philadelphia.

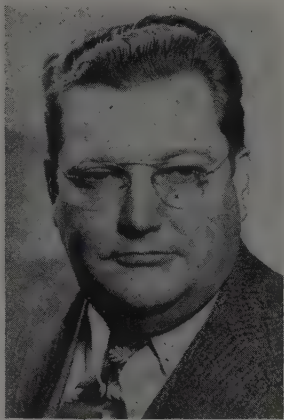
Henry H. Knapp has been appointed a sales representative, Railway Equipment Division, American Welding & Mfg. Co., Warren, O.

E. L. Ramsey, superintendent, open hearth, Wisconsin Steel Works, South Chicago, Ill., and 1947 chairman of the National Open Hearth Committee of the American Institute of Mining & Metallurgical Engineers, has retired.

Paterson-Leitch Co., Cleveland, has elected the following as directors of the company: **Charles J. Paterson**, **Robert I. Leitch**, **Wilbur J. Shenk**, **Rollin M. Beutel**, **Lawrence C. Spieth** and **Thomas H. Paterson**. **Charles J. Paterson** has been named chairman of the board. The following officers have been elected: **Robert I. Leitch**, president; **Wilbur J. Shenk**, vice president; **Rollin M. Beutel**, secre-



CARL F. ROBY
Elected vice president, Cincinnati Milling Machine Co., Cincinnati. Noted in STEEL, May 5 issue, p. 94



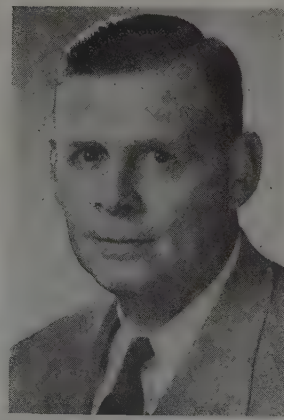
RUDOLPH E. REIMER

Elected a vice president, Dresser Industries Inc., Cleveland. Noted in STEEL, May 5 issue, p. 92



DAVID C. PETERSON

Appointed director of engineering and research, Chicago plant, Stewart-Warner Corp., Chicago. Noted in STEEL, May 5 issue, p. 90



JOHN J. PROHASKA

Elected vice president, Cleveland Automatic Machine Co., Cincinnati. Noted in STEEL, April 28 issue, p. 94

tary; William J. Burkhardt, treasurer; Norman H. Bolz, plant manager; and Thomas H. Paterson, assistant vice president.

—o—

L. C. Grimshaw has been appointed metallurgical engineer of the Clad Products Division, Jessop Steel Co., Washington, Pa.

—o—

Robert R. Kovach has been named to head the new district office in Chicago opened by the Electric Products Co., Cleveland.

—o—

William Mohr has been appointed regional manager in the Caribbean zone for Borg-Warner International Corp., Chicago.

—o—

Wayne Z. Friend has been appointed assistant section head of the corrosion engineering section, Development and Research Division, International Nickel Co. Inc., New York.

—o—

David M. Hallier, sales manager, National Tool Co., Cleveland, has been named vice president of the company.

—o—

H. Cliff Corwin has been appointed

sales manager, White Engineering & Mfg. Co. Inc., Rochelle Park, N. J. He was formerly connected with the Manley Division, American Chain Co., York, Pa.

—o—

G. Taylor Stanton has been appointed manager of engineering, Holtzer-Cabot Division, First Industrial Corp., Boston. He resigned as chief engineer of Tel-Autograph Corp., New York.

—o—

Stewart M. Lowry, former director of industrial relations and industrial engineering, Procter & Gamble Co., Cincinnati, has been elected to partnership of Booz, Allen & Hamilton, management consultants with offices in New York, Chicago and Los Angeles.

—o—

Richard M. Lawrence has joined the staff of the development department of Monsanto Chemical Co., St. Louis. He will specialize in market research work.

—o—

Alexander Gabay has resigned as president and general manager, Helwig Mfg. Co. Inc., St. Paul.

—o—

Joseph L. Paradis has been appointed sales representative for Automatic Temperature Control Co. Inc., Philadelphia.

He will maintain offices at Greensboro, N. C., and will cover the territory of North Carolina, South Carolina, and southwestern Virginia.

—o—

Thomas J. Kelley has been named to represent the Osborne Floating Piston Co. Inc., which was recently formed in Los Angeles county, Calif. Directors who have been elected to the board of the corporation are: Walter Osborne and Frederick W. Harling, both of Glendale, Calif., and Terence A. Duffy, of Los Angeles.

—o—

Genevieve M. Hanson, Robert J. Hanson, and Betty J. Hanson have been elected to the board of directors of the Aurora Welding & Tank Works, recently incorporated in San Joaquin county, Calif. The corporation will be represented by Blewett, Blewett and Warmke, 904 Bank of America Bldg., Stockton, Calif. It will manufacture, fabricate and repair metal products of all kinds.

—o—

Frank E. Lobaugh, formerly technical service manager, has been appointed technical service director of the Lumnite Division, Universal Atlas Cement Co., a United States Steel subsidiary, New York.

OBITUARIES . . .

Einar Lindeblad, 68, president of the Kloster Steel Corp., Chicago, died May 3 in that city.

—o—

Palmer W. Holmes, 45, manager of public relations, Acme Steel Co., Chicago, died Apr. 30.

—o—

Frederick R. Sites, 68, associated in various executive positions with the United States Steel Corp., Pittsburgh, from 1912 until his retirement in 1945,

died at his home in Swampcott, Mass., Apr. 29.

—o—

Philip H. Hutchinson, 57, development engineer, General Motors Corp., in the Hyatt Bearings Division, Harrison, N. J., died May 3.

—o—

Earle G. Leonard, manager of the Machine Tool Division, Buffalo Forge Co., Buffalo, died May 3.

—o—

Godfrey R. Rebmann, 85, retired vice president, Otis Elevator Co., New York,

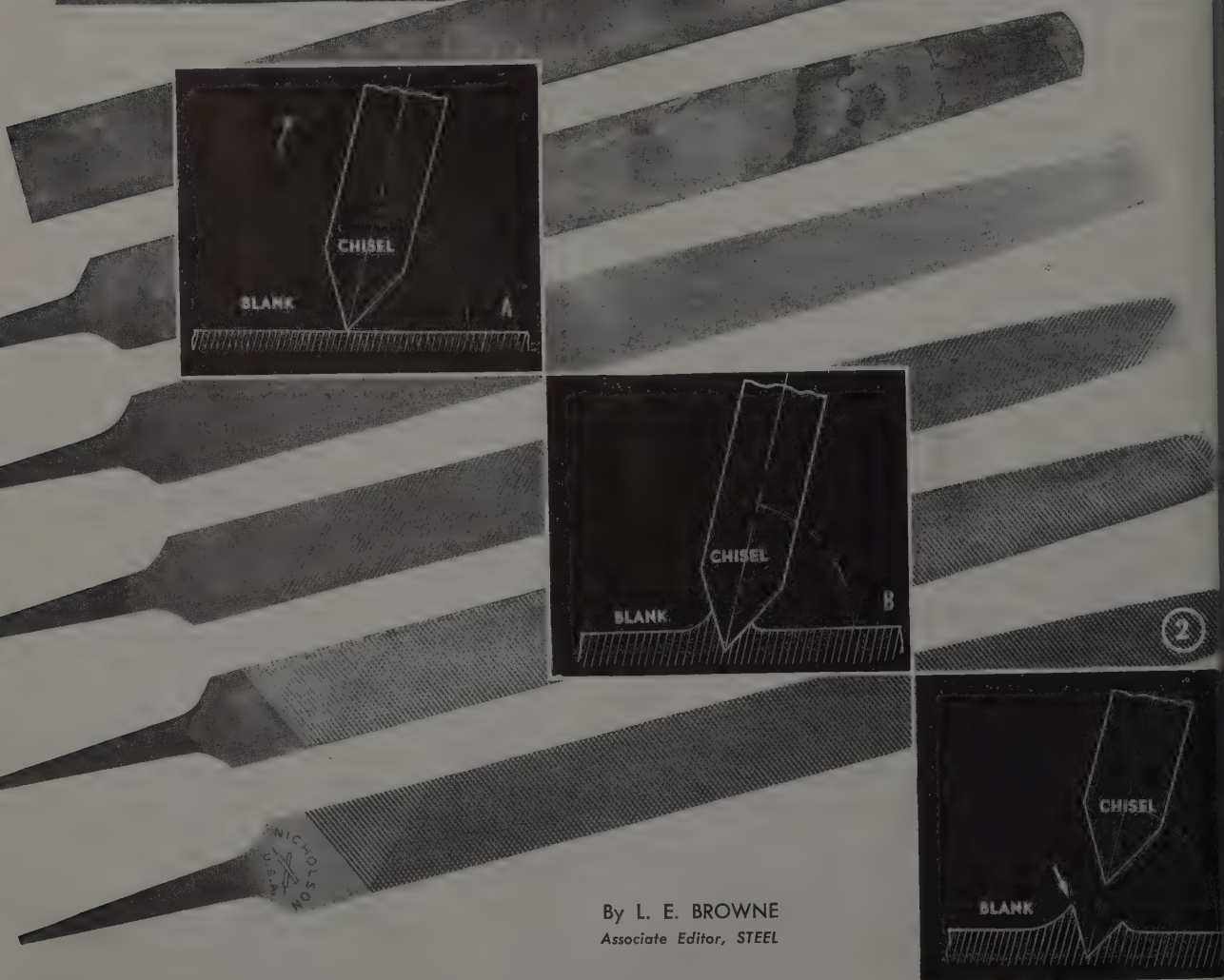
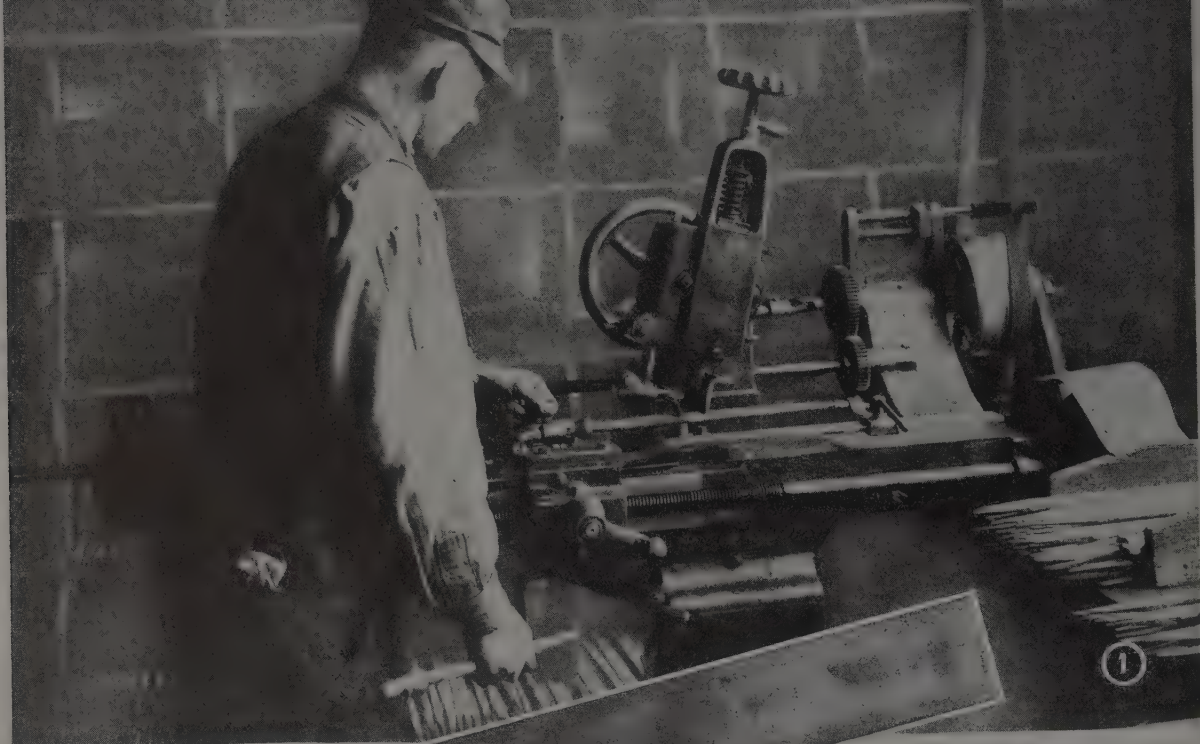
died Apr. 30. He also had been vice president and director of the United States Metallic Packing Co., Philadelphia.

—o—

Bruce Shotton, manager, Hendrick Mfg. Co., in the Pittsburgh branch, was killed recently in an automobile accident.

—o—

Frank H. Winkley, 61, former manager of the Lighting & Cable Division, General Electric Co., Schenectady, N. Y., died Apr. 30.



By L. E. BROWNE
Associate Editor, STEEL

Manufacture, Selection and Use of

"YET they had a file for the mattocks, and for the coulters, and for the forks, and for the axes, and to sharpen the goads." 1 Samuel 13:21.

Apparently in the reign of King Saul, about 1096 B. C., man had little or no choice in the selection and application of one of the world's oldest metal-cutting tools, the file. Note that the singular is used in reference to this tool in the Book of Samuel, but that numerous applications of it for sharpening implements are enumerated.

Prehistoric prototype of the file was the "rubbing stone" of hard, abrasive materials, utilized by primitive man in shaping and sharpening his stone hatchets, knives and scrapers.

Down through the ages the file has gone through many stages of evolution. The earliest ones worthy of the name were shaped something like broad saws, their teeth being coarse and running at right angles to the blades, and straight across. Files of this type, probably used 2000 years ago, have been unearthed in an ancient cemetery at Hallstadt in Upper Austria. While most of these are made of bronze, one of them is made of iron.

The first iron files, such as the one just mentioned, seem to have been made by Roman toolsmiths. As a matter of fact, some of them were made of a variety of mild steel. The largest Roman files which have come to light, are 1/2-in. wide, 3/4-in. thick, and have teeth cut on one side only.

One of the earliest writers on the subject of file-making was Theophilus Prysbeater, who held forth late in the 11th century. He describes the files of that period as

Fig. 1—Machine cutting round files at plant of Hayes File Co., Detroit

Fig. 2—Top to bottom: Bar cut to length; forged blank; after drawfiling and grinding; first cut of teeth; final or uppercut; branded and finished. Annealing, hardening and constant inspection are intermediate practice

Fig. 3—Cutting a file tooth. (A) Chisel about to enter surface of file blank; (B) chisel has finished stroke, displacing, but not removing, a portion of metal and raising it above the surface; (C) chisel, withdrawn, leaves a perfectly formed single-cut file tooth; (D) next stroke, etc.

Fig. 4—Tang is not included in length of file



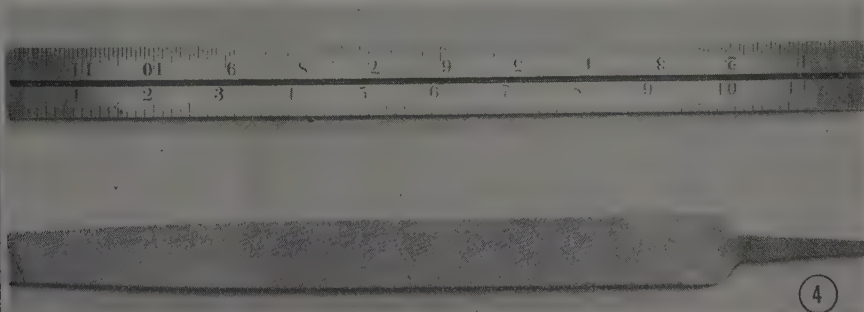
Consuming an estimated 25,000 tons of high carbon steel annually, file making constitutes one of the most highly specialized branches of the so-called "small tool industry". In this first installment of a three-part series, the reader is introduced to the various types of files and their manufacture, which started in 1096 B.C.

being variously "—four-square, round and three-cornered." According to him, some were of mild steel all the way through, others had soft cores and mild steel working faces. Their teeth were cut by means of a hammer having sharp, chisel-like "peens" on both ends.

Leonardo da Vinci dabbled in file-making, just as he did in many other matters far removed from sculpture, painting and music. Around 1490, about two years before Columbus discovered America, Leonardo actually made valiant attempts to cut files by machine. In this he was about 350 years ahead of time.

When machine-cutting finally did get under way, grinding as a method for smoothing file blanks still was an unknown factor. Therefore their final surface preparation was done with a hammer. Blanks of that era, being of mild steel, did not require annealing prior to cutting of teeth. Various methods were resorted to for the carburization of these mild steel file teeth subsequent to machine cutting, in order to give them the necessary degree of hardness to "take hold" on other materials.

Use of annealing furnaces in connection with file mak-



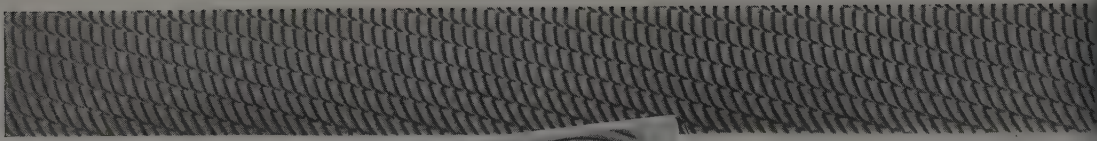
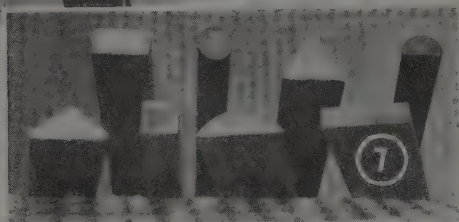
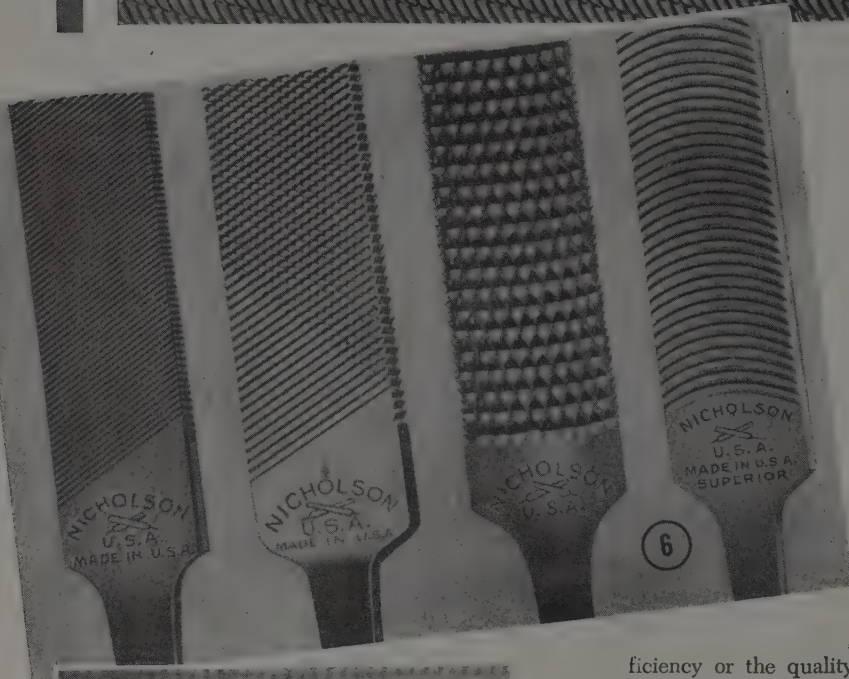


Fig. 5—Curved tooth file with super shear widely used on steel; the file, cut off-center, smooths after roughening

Fig. 6—Left to right: Single, double, rasp and curved cuts

Fig. 7—Eight standard bar shapes, mostly high carbon steel, from which files are manufactured

Fig. 8—Reference to kinds of files is distinguished by their cross sections



ing came in with adoption of higher carbon steels for file blanks. Descriptions of early annealing operations as conducted by file manufacturers at Sheffield and Newcastle, England are to be found in the writings of a contemporary author by the name of M. Jars. Cementation steel was used and the blanks were annealed with coke.

Frenchmen were the pioneers in building machinery for cutting teeth on file blanks. One of the earliest of these machines seems to have been constructed by the French inventor, Chopitel, in 1750. As many as twelve other file cutting machines were constructed between the years 1756 and 1862.

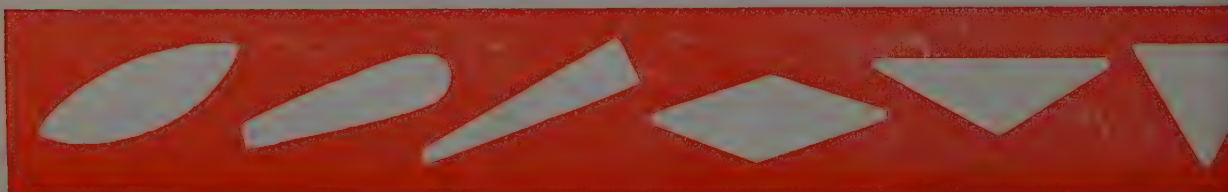
About 1765, in the famous tool-making city of Sheffield, an English genius made a file cutting machine which was driven by water power. Although this device is said to have turned out as many files as 50 men could cut by hand in a given length of time, either its mechanical ef-

iciency or the quality of its products did not please its inventor. In a fit of rage he destroyed his creation. The first truly practical and successful file cutting machine in England finally was perfected by the noted inventor James Nasmyth in 1840.

Records indicate that machine cutting of files was attempted in America as far back as 1836. However, it was not until considerably later that the inventive genius of such men as Nicholson, Bernot, Weed and Whipple resulted in the creation of fast, dependable machines so largely responsible for quantity production of high quality files whose uniformity has made possible today's remarkable degree of standardization of numerous kinds and cuts of files.

The modern mechanic has close to 5000 kinds of files, rasps and rotary file shapes, designs and cutting combinations from which to choose to do specific metal-cutting and finishing. For scores of materials, products and finishes, combinations of filing factors involved, including sizes and cuts, require flexibility in design and metallurgical practice to a high degree necessary for supplying the right file for the job. In metalworking industries, beginning with materials to be cut, this has been developed to an industrial science.

As in any cutting tool, angle of shear is important; and depth and coarseness of teeth, single or double cut and multiplicity of other factors are basic design problems.





Many files look alike, but have widely different applications, and selection of the proper file for a specific job is no routine accomplishment.

Manufacture of files is one of the most highly specialized branches of the so-called "small tool" industry. Furthermore, it is one of the largest consumers of high carbon steel, this consumption being estimated at 25,000 tons annually. Steel for some files goes as high as 1.00 carbon and over. This raw material is rolled into bar form, there being eight standard shapes. These are sold in various lengths, widths and thicknesses. As far as cross sections are concerned, square, rectangular, triangular, round, half-round and flat account for the main volume, Fig. 7.

High quality steel, held strictly to specification, is the basic requirement for an efficient file. Strict control of heat treatment and the various manufacturing operations pertains from stock rack to tool rack; only a few steel mills produce file steels. As a matter of fact, two supply the bulk of the carbon grades.

There are six major operations in file manufacture after a bar is cut to correct length for the file designed and each heat of steel is analyzed and tested for uniformity and quality, Fig. 2. The cut bar is first forged into a blank, one operation shaping the point and body and a second the tang. Annealing follows, a wide range of temperatures under closely controlled conditions being necessary due to the many kinds of files needed to meet thousands of applications with varied requirements.

Surface preparation follows annealing; blank is straightened, ground for scale removal and drawfiled for uniform teeth and filing surface. Grinding is an important detail, preparing the surface for cutting of teeth.

For cutting, the industry has developed its own machinery largely; there are no standard lines of file cutting machines, but development of the industry to its modern high level of productivity, tolerances and efficiency revolves largely around cutting machinery.

A series of teeth on the file blank is raised by a machine rapidly operating sharp chisels, the finishing stroke displacing, but not removing the metal, raising the displaced section above the surface. Hundreds of precision teeth are cut on a single file. A single-cut file has a single series of teeth while double-cut tools have two series of diagonal teeth. Others have curved or wavy teeth in many combinations, Fig. 5.

After cutting, the file is branded and hardened, teeth points given protection to prevent oxidization by a special coating. Brought to a predetermined temperature,

TABLE I
SHIPMENTS OF FILES AND RASPS FOR METAL CUTTING
AND FINISHING¹

Year	(Thousand Dollars Shipments)	
	Total	Monthly average
1937 [*]	12,356	1030
1939 [*]	10,701	892
1941	20,280	1690
1942	21,480	1790
1943	24,547	2046
1944	21,994	1883
1945	21,985	1832
1946 [#]	20,845	1737

^{*} Census of manufacturers.

[#] Estimated.

¹ 16 companies, representing 98 per cent of the industry.

varying according to degree of hardness required, quenching follows for uniform hardness. Finishing involves cleaning, sharpening to prepare the teeth for service and the tang is reheated and blued for strength and toughness without brittleness. To resist rust, the file is finally oiled. Although under strict control from bar to oiling during process of manufacture, files are given a final series of tests by cross-checking methods.

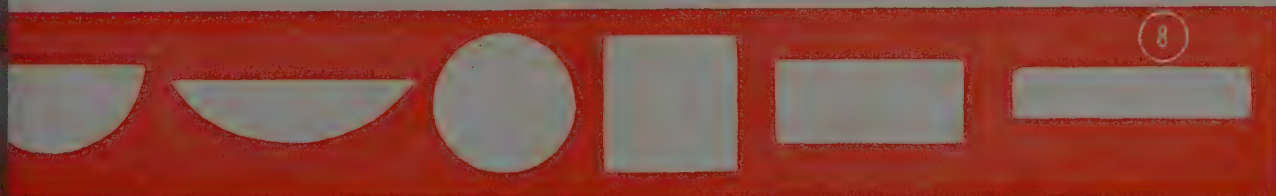
File Names and Common Features: In general, files and rasps have three features common to most types: (1) Length, always measured exclusive of tang; (2) kind, or name, in reference to shape or style; (3) cut, referring to both the character and relative degrees in coarseness of teeth. The tang, prepared for the handle, is never included in the length which bears no fixed ratio to either width or thickness even in files of the same kind, Fig. 4.

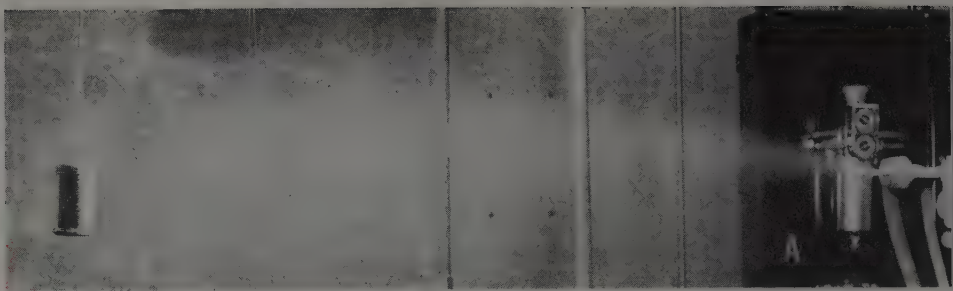
File names, covering various shapes and styles, include flat, mill, half-round, etc., which in turn are divided from the form of their cross sections into three general geometrical classifications; quadrangular, circular and triangular. In addition there are other odd and irregular forms or cross sections classified as miscellaneous, Fig. 8.

According to contour, cross sections are further subdivided into taper and blunt. Tapered files have points more or less reduced in size, both width and thickness, by gradually narrowing sections extending from one-half to two-thirds the length from the tang. From point to tang, a blunt file has uniform sectional size throughout.

With reference to character of teeth, cut of files is divided into single, double, rasp and curved, and, depending on coarseness, into rough, coarse, bastard, second cut, smooth and dead smooth. Single-cut files, with one series of teeth, to produce a smooth surface finish, are generally used with light pressure or for a keen edge on knives, shears, saw-teeth and other cutting tools. With two series of teeth double-cut files are used under heavier pressure for fast metal removal or rougher finish, Fig. 6.

Rasp cut is a series of individual teeth, produced on blanks by a punch-like, narrow, sharp-cutting chisel. Used on lead, aluminum, wood, leather, hoofs and softer metals for fast removal of material, (Please turn to Page 132)





Spraying in Electrostatic Zones

"Guided spraying" is cutting material costs and improving quality while doubling and tripling production in finishing departments of diverse industries

By JOHN PARINA, JR.
Associate Editor, STEEL

SINCE the relatively recent appearance of the first report on the electrostatic spraying process (STEEL, June 7, 1943, p. 126) which forecast its economic benefits, many diverse industries have now accepted this method as an indispensable aid to high speed quantity production of spray coated parts. Reports of savings realized with electrostatic spraying cited in this article corroborate and add to the list of successful applications. (Earlier accounts of this technique appeared in STEEL on August 9, 1943; February 7, 1944; November 12, 1945.)

The correction of two difficulties that long have plagued finishing engineers are responsible for the widespread acceptance of this process. It is now possible to realize very substantial savings in paint consumption because only a negligible amount is lost from overspray, and the use of electrostatic fields assures an even coverage of all uniform surfaces. Fig. 1 is a graphic demonstration of the relative efficiency of the usual spray and the electrostatically

guided spray. In (A) ordinary spraying covers only the facing surfaces whereas in (B) the spray literally envelops the article because of the attraction between paint particles and the entire surface of the article. Additional advantages are: Edge surfaces are covered without any apparent thickening of coating at the juncture of edge and side surfaces, and the speed of finishing line can be correlated very closely with the rest of the production line. The manner by which these savings and advantages are realized can be explained by describing the underlying principle of the method.

Electrostatic spray finishing is made possible by the simple fact that unlike electrical charges attract each other. This law is made to be of service to spray coat finishing in the following manner: A charge of electricity is imparted to the sprayed paint particles by having them pass through an ionizing electrostatic field after leaving the gun; at the same time, the (Please turn to Page 139)



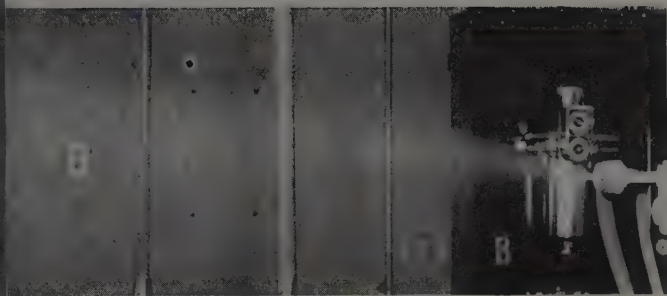


Fig. 1—In (A) ordinary spraying covers only the facing surfaces whereas in (B) the electrostatic field has guided the paint particles to surface area of the can



Fig. 2—Electrostatic detearing action is shown here. The field has been turned on and is removing excess paint

Fig. 3—Fixtures made at John C. Virden Co. passing through the electrostatic spray finishing booth



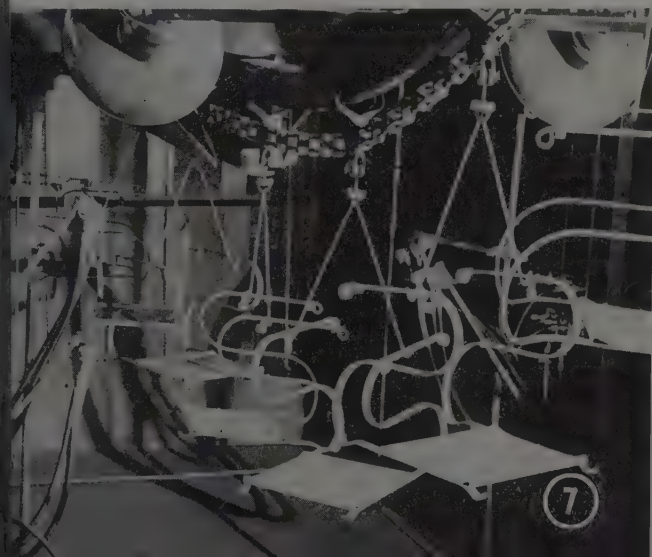
Fig. 4—After coming out of the spray booth the electrical fixtures go to infra-red drying oven shown in the background

Fig. 5—Inspection and packaging station for the fixtures. The John C. Virden Co. has increased its production from 300 units per hour to 1000 units per hour with the use of the Ransburg electrostatic finishing system



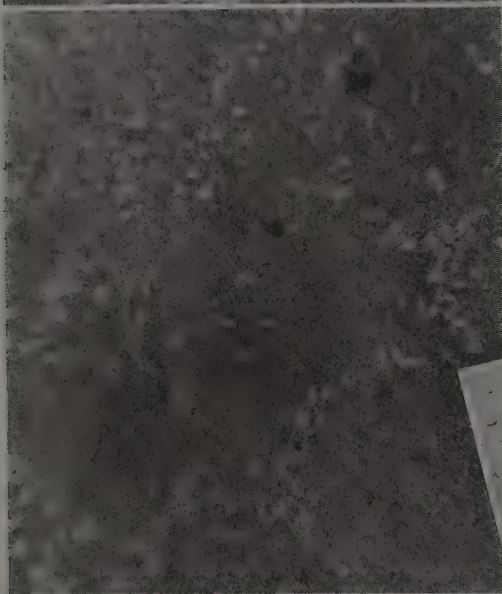
Fig. 6—Pennsylvania Range Boiler Co. reduced labor 66 per cent, paint consumption 50 per cent, and improved finish quality on these hot water jackets with electrostatic spray coating

Fig. 7—This automatic electrostatic spray line at National Production Co. increased production rate $2\frac{1}{2}$ times and cut paint costs 40 per cent





1



2



3



Fig. 1—Cleavage structure here is normal and is due to rapid cooling for sample from casting temperature. Clearly seen, the separating element, ferrite, is retained in crystallographic planes of octahedral crystals. (2 per cent nital X 400)

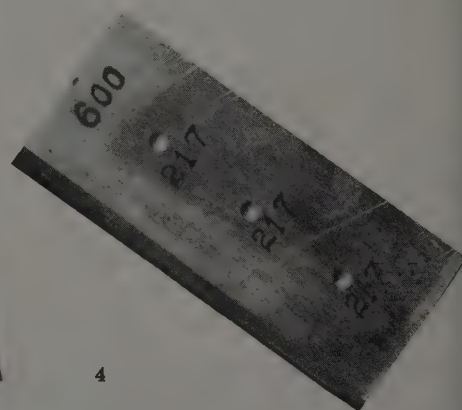
Fig. 2—Transition zone. Structure is mainly pearlite and sorbite with remnants of ferrite. Transition zone is acting as stress absorber between case and core. (2 per cent nital X 400)

Fig. 3—Case near surface. Due to critical composition, A_{r1} point was lowered and, whole austenite transformed into martensite. Case depth corresponds roughly to depth to which temperature was above A_{r3} temperature. Austenitizing time, as a rule, is short because of intensive heating applied by oxyacetylene torch. (2 per cent nital X 100)

Fig. 4—Brinell hardness survey of fracture specimen

Fig. 5—Sedan turret top trimming die—8672 lb

Fig. 6—Automobile door panel dies



4

TABLE I

WATER QUENCH		AIR QUENCH	
Depth of hardness, inches	Rockwell hardness	Depth of hardness, inches	Rockwell C hardness
0.006	61-61	0.005	55-56
0.021	62-62½	0.016	54-54
0.031	63-63	0.029	49-49
0.041	62-62	0.039	45-45½
0.050	61-62	0.050	42-43
0.059	60-60½	0.060	41-40½
0.076	47-49¼	0.079	33-32½
0.069	30-32½	0.089	28-28
Core	28	Core	28

Allotropic transformation of new type air hardening steel, described here,
is lowered by controlling chemical analysis to produce high hardness in depth

Hardened

STEEL

By S. T. JAZWINSKI

Chief Metallurgist

Barium Steel Corp.

Canton, O.

APPLICATIONS of flame hardened cast steels in recent years have grown rapidly. The hardening process involved calls for use of the oxyacetylene flame to raise the temperature of the surface above the A_{c3} transformation point and a subsequent water quench, producing the required hardness on the surface, leaving the core soft and tough. In order to quench to desired hardness, the spray of water must follow in a definite distance from the flame. The geometry of the object plays an important part in efficient operation.

Described here is a relatively new type of air hardening steel which is called, for simplicity, "E-4", and which was developed by the Detroit Steel Casting Co., Detroit. Principal feature of the steel is that the allotropic trans-

formation is lowered by control of chemical analysis and, as a result, air cooling is sufficient to produce high hardness in depth. Air hardening properties open new fields of applications. The only hardening tool required is an oxyacetylene torch. It is obvious that geometry of the part is of no significance for successful treatment. This is the principal difference between this type of steel and hardening process, and the so-called "Shorter" process.

Experience has shown that close control of chemical analysis exerts the major influence on behavior of this type of steel. An excessive amount of chromium will produce steel prone to crack. Deficiency of other elements can eliminate the air hardening properties.

The steel is produced in acid open-hearth and electric arc furnaces. Total amount of alloying elements is selected to the so-called critical percentage and therefore causes the sudden lowering of the A_{r1} point accompanied by the formation of martensite.

Limits of chemical analysis are as follows: Carbon 0.40-0.50; manganese 0.80-1.20; silicon 0.35-0.45; sulphur 0.05 max.; phosphorus 0.06 max.; chromium 0.80-1.20; molybdenum 0.20-0.40; copper 0.70-1.10 per cent.

Higher copper is used to depress the A_3 point (similar to carbon), the effect of one being intensified by the presence of the other. In addition, copper favors hardening, as more martensite is formed at intermediate hardening temperatures. Precipitation hardening is important due to elimination of steel hardness gradient between case and intermediate zone.

This steel shows high physical properties and even in high ultimate strength is very ductile. This was considered an important aspect, because when hardened on the surface the core remains tough. (Please turn to Page 146)

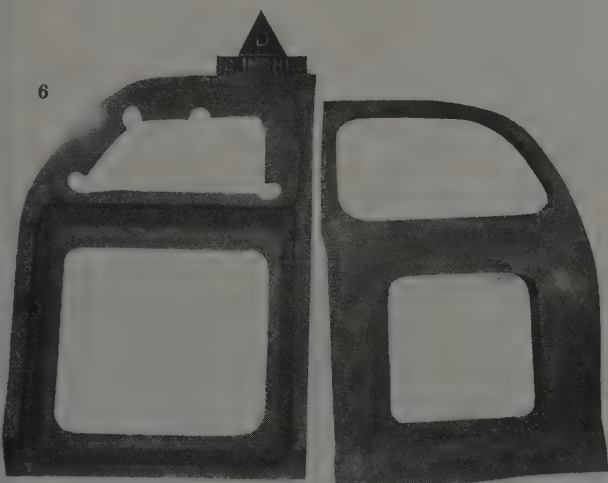


TABLE II

Draw temperature °F	Brinell hardness	Rockwell C hardness
Oil quench (no draw)	512	53
700	444	47
800	418	44
900	387	41
1000	375	40
1100	332	35
1200	293	31
1300	241	23

TABLE III

Heat treatment	Yield point psi	Ultimate strength psi	Elongation per cent in 2 in.	Reduction of area, per cent	Hardness brinell
Oil quenched drawn at 1200° F.	113,000	130,250	15	35	286
Normalized drawn at 1200° F.	90,500	118,500	17.5	44	250

STEEL CASTING

Modified by High-Voltage Inspection

Use of million-volt x-rays in studying such irregular shapes as crankshafts and jacks, regardless of size, leads to better designs and quality production at lower costs

ONE of the few industries that illustrates well the value of x-ray in quality control is the foundry business. In this business there are so many variables throughout the process of production that it is important to have one "supreme court" before which each slight change in method can be tested and retested.

X-raying pilot lots, and re-examining periodically thereafter, provides a close, continuous check on production quality, and prevents faulty castings from ever leaving the foundry. Resultant reduction in rejects produces *both* an immediate dollars-and-cents saving, and a long-range gain in customer good-will. In addition, x-raying castings before machining saves countless hours of machine shop time.

Although destructive testing is still employed to a limited degree, even in plants stressing x-ray, it becomes chiefly a corroborative measure and a means of studying

more precisely the exact nature and extent of a defect. X-ray, being a low-cost-per examination type of inspection, makes it possible economically to keep a multitude of variables constantly under control.

Auto Specialties Mfg. Co., specializes in products for the auto industry, chiefly cast steel crankshafts and malleable iron castings; also it manufactures hydraulic and mechanical jacks. The firm is of medium size, yet has some of the most modern foundry equipment in the country. All of its operations are conveyorized—from coring to pouring. Its electric furnaces bring 12-ton melts to desired temperature for pouring within 2½-hours after the cold charge is made. Pouring of an entire crankshaft mold end-on requires only 50 sec.

Originally, the company used a General Electric 220,000-volt x-ray unit, for inspections. One year ago, however, a 1,000,000-volt G-E unit was installed in a special

Fig. 1—Wide latitude of high-voltage x-ray to sections of varying thickness is shown by this radiograph of assembled jack

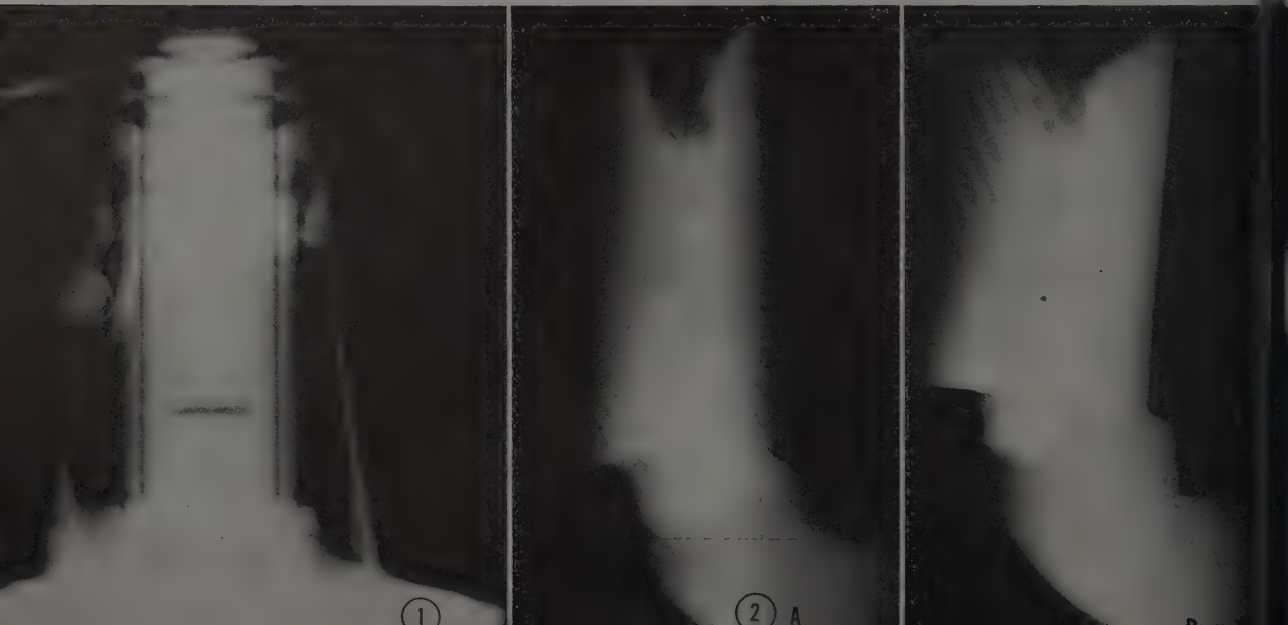
Fig. 2— (A) Radiograph of motor housing before reduction in weight effected in sprue-and-runner. (B) Sprue-and-runner on motor housing after reduction of 5½-lb. Despite reduction, no cavitation extends into casting proper

Fig. 3—(A) Portion of crankshaft radiographed to show

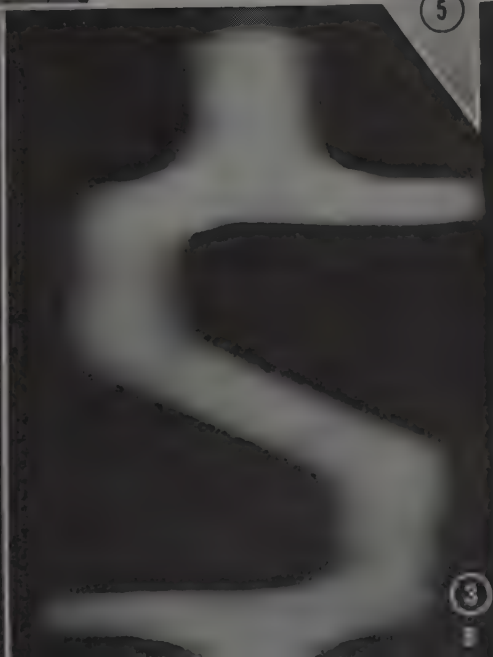
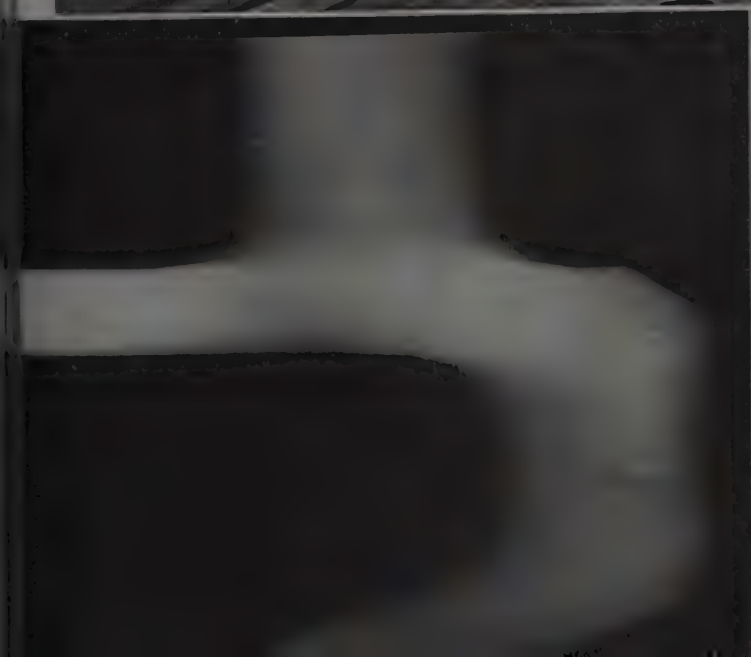
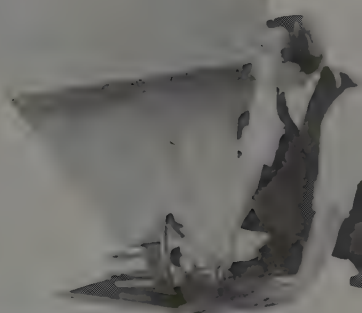
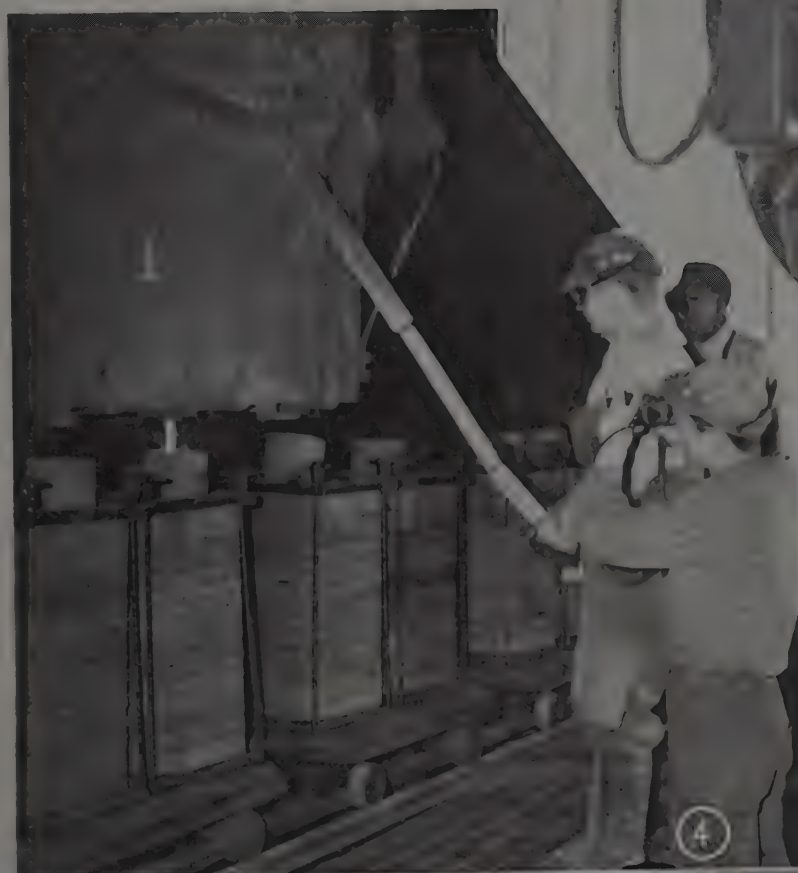
shrinkage caused by location of gate at bearing. (B) Same crankshaft showing elimination of shrinkage after gate shifted to arm

Fig. 4—View showing how crankshafts are cast vertically into cores

Fig. 5—Author is shown here aligning beam of the million-volt x-ray unit before radiographing a motor housing. All photos courtesy General Electric X-Ray Corp.



PRACTICE



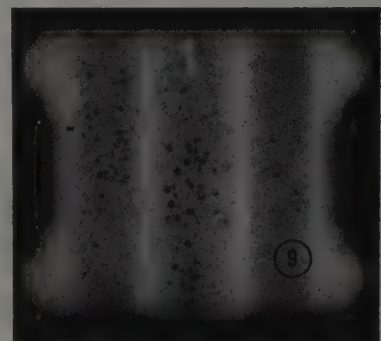
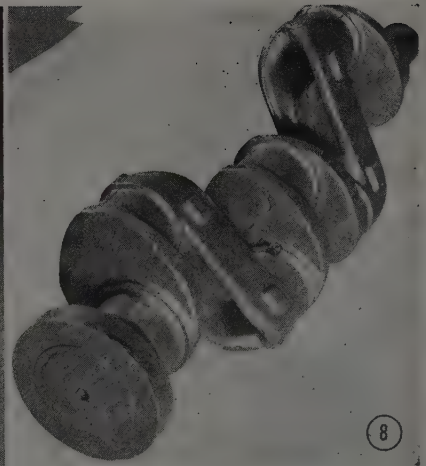
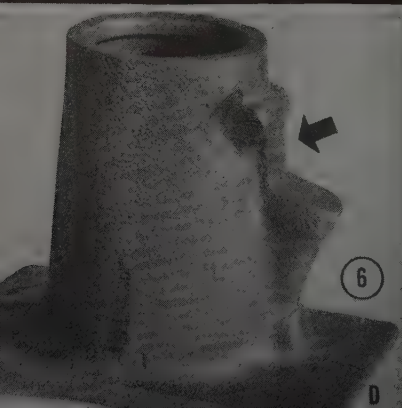
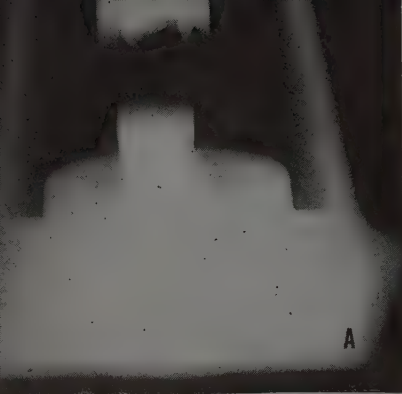


Fig. 6—(A) Radiograph of jack base in which shrinkage occurred in web below gate because of restriction in flow between two protruding parts. (B) Same jack base indicating result of attempt to eliminate shrinkage by welding. (C) Still same jack base revealing how redesign eliminated shrinkage — web area enlarged. Rejections cut from 25 per cent to 0. (D) View of jack base. Arrow shows web, size of which was increased to permit vertical flow and eliminate shrinkage

Fig. 7—Radiographically-controlled casting procedures permitted development of this design, with partial hollows in the bearings and complete hollows through center of crankshaft

Fig. 8 — How casting permitted hollowing out of bearing areas on certain type crankshafts, with great saving in weight

Fig. 9—Radiograph showing pinholes in casting caused by insufficient de-oxidation of the melt

to use high-voltage x-ray economically. Exposure time economies of higher voltage are equally available to the producer of small castings, such as motor housings, automotive crankshafts and the like. Also because of its higher intensity, the more powerful x-ray equipment can be backed further away from the film, permitting the radiography of more products with one exposure.

Radiography of crankshafts, for example, is done at a target-to-film distance of 10 ft. This permits getting six or more crankshafts at one time. These occupy such a large area that more than four films must be overlapped to include all the shafts.

Because of its shorter wavelength, high-voltage x-ray can encompass a greater range of thicknesses in a single radiograph, thus making it ideal for such irregular shapes as crankshafts and jacks, regardless of size.

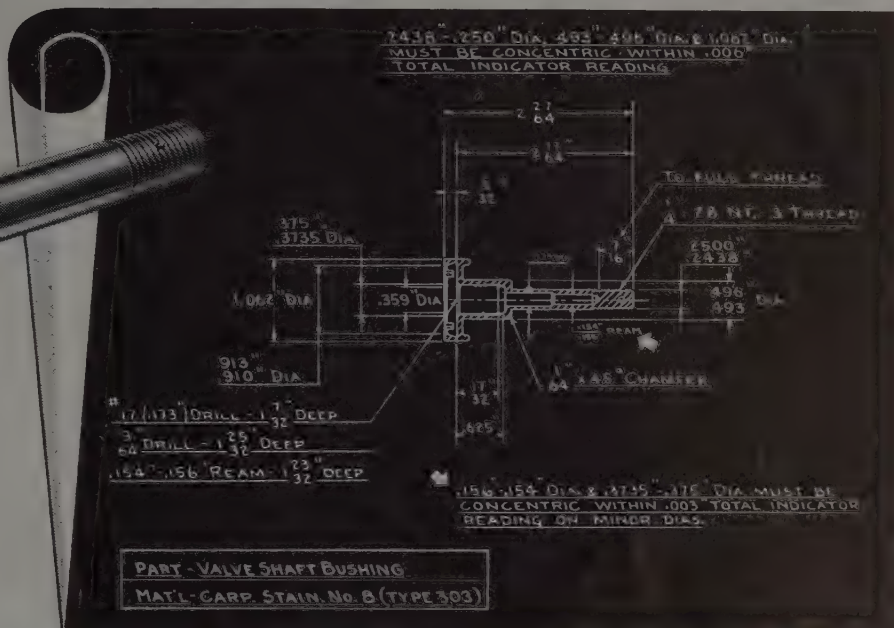
Many outstanding case histories in which x-ray findings played a vital role in increasing yield—modifying production processes, and even in changing the design of a product—repose in the company's radiographic files.

The case of a sprue-and-runner change in casting a motor housing, Fig. 2, is typical. As a result of radiographic study, it was found that this sprue and

(Please turn to Page 136)

concrete building. Now the company does practically all its radiography of both large and small objects, with the larger unit. It was found that greater speed and elimination of copper-shot blocking, possible with the high-voltage machine, make it preferable in many instances to the smaller.

Experience shows that—contrary to commonly-held opinion—one does not have to be a producer of heavy castings



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Engineering News at a Glance

INDUSTRIAL "SCOUTS": Trade conditions and possibilities for immediate and long-range business by American firms are to be studied in European countries by J. T. Jackson and L. P. Jackson, president and vice president respectively, of Mid-West Abrasive Co. The two officials recently left the country to visit England, American and English occupation zones of Germany, Holland, Belgium, Denmark, Norway and Sweden, it was learned in Detroit. They plan to give particular attention to development by European metallurgical engineers of new abrasive materials, and to new uses for abrasives developed by concerns abroad.

BARES ENGINE WOES: Society for Automotive Engineers reports in its latest journal that pictorial detection of aircraft engine troubles in flight with a recently developed engine analyzer can eliminate flight delays due to ground trouble shooting, and increase flying safety by warning of impending failures. The instrument gives continuous visual analysis of the complete powerplant. On its scope are shown characteristic patterns of ignition-system performance, changes in mixture distribution, synchronization between magnetos and engines, engine roughness and vibration. By properly interpreting these patterns, the flight engineer can locate and identify existing troubles, anticipate others and adjust engines for optimum operation.

JET ENGINES IN 1936: According to a report prepared for the Department of Commerce by the Air Materiel Command of the Army Air Forces, the Germans started work on jet engines several years before the war, building the Jumo 004 in 1936. More than 5000 were produced. Production was at a rate of over 1500 per month when the war ended. Preliminary work on jet engines was done by the Germans as early as 1934, although the 003 turbojet was not started until 1939. About 6000 of these 003s were made, and some 200 planes were equipped with this type engine.

EXPERIMENTAL DUGOUT: In a "bomb-proof" dugout at the Westinghouse research lab scientists are preparing to explode whirling, red-hot disks of metal in an effort to determine the maximum strength of parts for aircraft jet engines. Disks of specially-developed alloys, 1 ft in diameter and 1 in. thick will be heated to temperatures above 1400° F, and spun at the blurring speed of 1200 mph—35,000 rpm—until they

literally fly apart under the combined attack of centrifugal force and heat. They will be placed in the center of the dugout, ringed with heavy sandbags, and attached to the shaft of an ultra-high speed motor located 10 ft below the dugout floor. During the testing the 32-lb disks will be covered by thin steel hoods from which air has been evacuated to reduce friction. Hoods are intentionally thin so flying fragments will easily pierce them allowing scientists to study the undamaged pieces.

BLACK FINISH IN MINUTES: From Chicago, D. C. Cooper Co. reports development of an alkaline salt which, mixed with water and heated, provides a uniform black finish on steel parts in 5 to 15 min. The single-bath process is said to place a finish on metals that will not peel, rub off, crack or chip. It also is rust resistant. The company particularly recommends the coating for metal cutting tools and machine parts.

INVOLUTE SPLINE STANDARD: In discussing the newly revised standard covering involute splines, major coupling elements used in connection with gears and shafting, S. O. Bjornberg, consulting engineer, Illinois Tool Works, points out in the latest issue of *Industrial Standardization*, that the charge pushes to a new high state of development the ASA work on splines which has been in progress for 25 years. It provides wide advances over the previous standard issued in 1939. For example, one of these is the reduction to 15 in the number of hobs necessary to cut new series of splines, from the 285 hobs required under the 1939 version.

SOLVES POWER PROBLEM: Method of running 3-phase motors on single phase power or single phase motors on 3-phase power was devised recently by Home Products Inc., Los Angeles. According to the company, it is not necessary to change any wiring inside the motor. The whole procedure is accomplished in 5 minutes.

HANDLES 22 OPERATIONS: Twenty-two machining operations—drilling, boring, chamfering, spotfacing, reaming and tapping—operations formerly handled on separate machines in processing cast iron steering gear housings, are combined in one automatic machine designed by Snyder Tool & Engineering Co. of Detroit. The machine, according to the company, completes one housing every 50 sec. Both high speed steel tools cutting at 90 fpm and tungsten

carbide tools cutting at 240 fpm are employed by the unit.

CLUES FROM TEMPERATURES: Measuring temperatures as a means of detecting unpredictable and erratic pre-ignition failures is the principle on which Standard Oil of California built a pre-ignition detector for aircraft engine trouble-shooting in flight. In discussing the development before the Society of Automotive Engineers recently, W. V. Hanley, Standard Oil Co. of California, reported the instrument indicates 150 temperatures within 5F accuracy several times per second. It gives the maximum temperature continuously on a conventional aircraft temperature indicator regardless which of the 150 temperatures is maximum at the moment. Any thermocouple other than the one that is maximum can be read by turning a selector switch. Warning bell or light operates whenever one of the temperatures exceeds a preselected value.

EXAMINES PROPELLER INTERIORS: At Curtis Wright, a viewing instrument equipped with a 100 w black light only one-third the size of a cigaret, is used to inspect interiors of hollow steel propeller blades during their manufacture. Process of examination with the instrument—developed by Lenox Instrument Co. in collaboration with Magnaflux Corp.—is relatively simple. Interior of prop blade first is treated with a fluorescent penetrant. Then the device is inserted and the inspector, looking into its eyepiece, obtains a detailed view of the copper fillet inside the prop, exactly as it is, without magnification of the original image. Any flaws become glowingly evident under the black light, even if they are no more than hair-line cracks.

CAPTURES STRUCTURES: In studying crystalline substances at high temperatures through x-ray diffraction, the study is not always successful because certain substances revert to their normal structures so rapidly that the high-temperature forms are not present after cooling. The failure to "capture" the structures in such cases is attributed to the film used in x-ray diffraction devices. It seems the photographic film must be kept in a cool place, its application being limited to temperatures of about 1000° C. To investigate those modifications existing at high temperatures, as well as rates of inversion and crystal formation, H. F. McMurdie and A. Van Valkenburg of the National Bureau of Standards, Washington, developed an appar-

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atus by which patterns may be obtained while the materials are still at elevated temperatures. The new equipment, using a Norelco x-ray spectrometer in which a Geiger counter replaces the film, obtains patterns with specimens maintained at temperatures up to 1500° C. It produces a pattern immediately in usable form and, by adjusting the temperature to a new value, it provides a new pattern in a matter of minutes.

GRINDS WITHIN 3 LIGHT BANDS:

By removing 48½ lb of glass from one casing and 60 lb from another in a total time of less than 26 hours, Blanchard Machine Co., Cambridge, Mass., recently saved Boston U's lab at least 160 hours of labor on the two blanks. Object of the surface grinding chore in Cambridge was to flat-grind and concave, with an accuracy of 3 light bands, 30 x 8-in. Pyrex glass disks slated for the optical system of a new, high velocity wind tunnel to be used at Langley field. Incidentally, a light band is only 11 millionths of an inch. Monochromatic light must be used with an optical flat to even measure such flatness.

STAMPS STEEL CASKET: From Alliance, O., Alliance Ware Inc. reports it is successfully stamping seamless steel caskets to meet requirements of the War Department's Quartermaster General. Already the company has delivered approximately 10,000 sets of these stampings which are being drawn under dies

weighing about 30 tons. Considerably larger than a bathtub, each one-piece stamping is made on a huge 2000-ton press. Blank used measures 54 x 107-in. to provide a finish stamping 27½-in. wide, 82½-in. long and 13-in. deep. It is of 16-gage and weighs more than 95 lb.

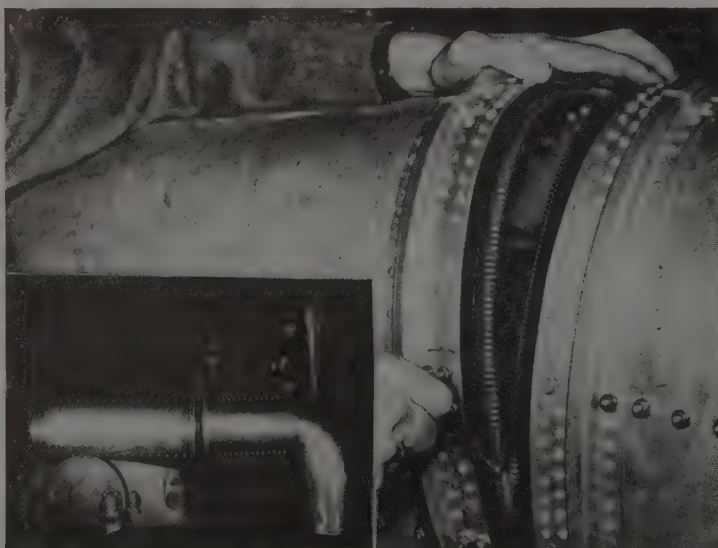
WINS SAFETY TROPHY: In Southbridge, Mass., it was learned, American Optical Co. recently was awarded the grand trophy for 1946 in a state-wide accident prevention contest sponsored by the Massachusetts Safety Council in cooperation with the Associated Industries of Massachusetts. The award, presented annually to the industrial concern in the state adjudged safest in which to work, was won in competition with 325 companies. The optical concern's traditional attitude in providing corrected, protected vision for its employees is attributed as one of the vital factors in winning the contest. The company, however, also won an award for operating its trucks during the same period without accidents.

MARKETS TAP CHUCK: Extreme lightness and small diameter of the tap chuck currently distributed by Jacobs Mfg. Co. of Hartford, Conn., combine to develop less torsional inertia, reduce tap breakage particularly in bottom tapping and allow for quicker reversing and higher spindle speeds. The chuck represents another application of the suc-

cessful Jacobs Rubber-Flex collet, the company reports. It makes tap changing a simple operation. For example, a quarter turn of the cap and the screw connecting the positive driving jaws completely disengages the tap from the chuck. Because the collet jaws are rigid steel pieces ground to a fixed shape and all flexing is assumed by the synthetic rubber web separating the jaws, parallelism of jaw bites is assured throughout the entire collet range so the smallest tap is held as firmly and as accurately as the largest.

STOPS "SILENT DEATH": Deaths, either directly or indirectly due to carbon monoxide poisoning, can be reduced drastically by the use of a device developed and manufactured during the war by the National Bureau of Standards. The detector, about the size of a pencil and used extensively to detect poisonous fumes in plane cockpits, detects and closely estimates less than one part of carbon monoxide per 500 million parts of air. This is said to allow a big safety factor because it takes about one part of the gas in 10,000 parts of air to affect the human system. According to United States Safety Service Co., Kansas City, Mo., which is licensed by the government to manufacture the instrument, the tiny device will be in full production within the next few months. Its use involves procedures so simple that untrained personnel can handle it adequately.

REMEMBER THE BEND: Probably the most difficult part of applying hard facing alloy Colmonoy No. 6—the non-sparking, nonmagnetic and corrosion-resistant metal supplied by Wall Colmonoy Corp., Detroit—is determining when it reaches its plastic range. When heated, the alloy remains in solid state until it reaches the temperature of 1850° F. From then on it begins to turn plastic or "mushy," and continues in this condition until it reaches the temperature of about 2050° F, at which time it has approximately the same viscosity as thick gravy. In the latter condition it is too fluid to have any value from a fabricating standpoint. But between the temperatures of 1850 and 2050° F, the alloy will wet and bond to steel without flowing. In this range it also may be hot formed, hot wiped or roll formed. While coefficient of expansion of the metal closely approximates that of steel, it is slightly higher. Thus an overlay of the alloy has a tendency to arch a bar which is being overlaid on one side only. General practice in overcoming this is to reverse bend the section so that upon application of the alloy the piece will be pulled straight. When bending it should be remembered the surface being overlaid should be the outside of the bowed piece.



PRESSURE LOCKING ZIPPER: Sections of supercharger air ducts on the Republic XE-12—4-engine Army photographic plane with a 4000-mile range and speeds above 450 mph—are sealed with the rubber and metal device above, manufactured by B. F. Goodrich Co., Akron. Twelve of these pressure sealing zipper units are required for the aircraft, three from each of the supercharger ducts to the four 28-cylinder engines



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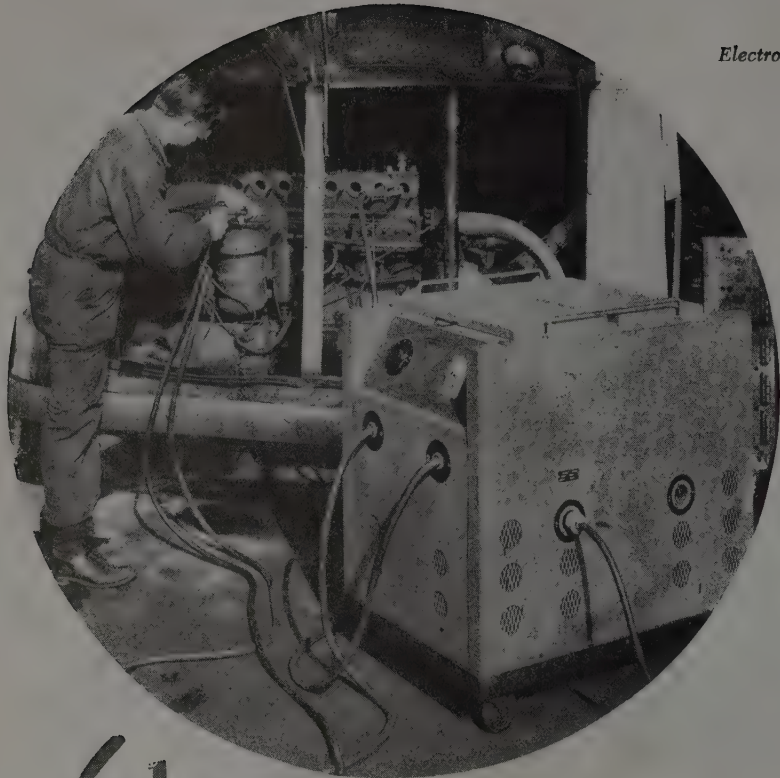
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Electro-bond welding of cracked block after crack is grooved and pinned

Weld Repairing

DEFECTIVE AND DAMAGED CASTINGS

ONE of the major problems facing industry today is the shortage of aluminum, cast iron, and bronze castings. Important among the reasons for shortage is the high number of production rejects. Hidden porosity and pinhole leaks are responsible for many of the rejections.

Other types of castings are subject to shrinkage, sand pits and blowholes. Also castings for various types of engines which have been in service, develop porosity from being rebored or as the result of overheating or freeze-up. Engine blocks are also occasionally damaged by cracking or having a section driven out by a broken rod.

The Moguloid Co. of America, Chicago, carried on extensive experimental research in an effort to develop a process which could overcome these difficulties in repair. Outcome of studies is the Mogul Arc Bonder, a low voltage high amperage unit utilizing compressed air. With this equipment it is possible to repair cracked motor blocks, fill blowholes in castings as well as to add metal to aluminum patterns, building up press fits for loose bearings and races and many other operations.

Similar to other welding units there are two leads from the transformer, one for the ground and the other for the electrode. The electrode holders, however, are different. For the Arc Bonder there are two types of electrode holders, called pistols. One features a vibrating or peening action for casting salvage work. The rod goes through the center of the pistol with a nozzle surrounding the rod as it is inserted. As the metal is deposited a constant stream of cooling air from the compressed air unit is focused on the work, blowing away any slag from the deposited metal and preventing heat distortion or stress.

Where the equipment is used for repair of cracked engine blocks, the electrode pistol is recommended. The unit is specially designed for this type of work having a 10-in. insulated extension which permits it to get into a cylinder wall or other parts of the block and weld the metal at the point of the crack without shorting. Large holes in blocks can be repaired by closing with a welded plate. A very common crack such as a valve seat on a V-8 motor can be grooved, welded, peened and finished in 20 min.

In the repair of industrial pressure casings the concern is not so much with slight surface defects but rather with pressure loss due to hidden porosity. To combat this pressure loss, a colloidal compounded of copper and chrome flour suspended in a solution, was developed. The heated colloidal is circulated through the castings under pressure. The minute metallic particles suspended in the solution are pressure forced through the porosity until striking the air. The air causes the solution to harden interlocking the metallic particles for a permanent bond from the outside in, to the thickness of the casting itself. One of the primary reasons for the lasting effectiveness of this process is that no paper pulp or other deteriorating substances, which would act only as temporary plugs, are used in compounding the colloidal.

Among the users of this sealing process are manufacturers of motor blocks, heads, compressor cylinders, pumps, pressure cookers and valves. General procedure is to use the colloidal heated to 1750° in an 8 to 1 solution with water. By circulating this solution castings can be impregnated to withstand pressures up to 2100 lb, whether used for steam, oil or for the various chemicals.

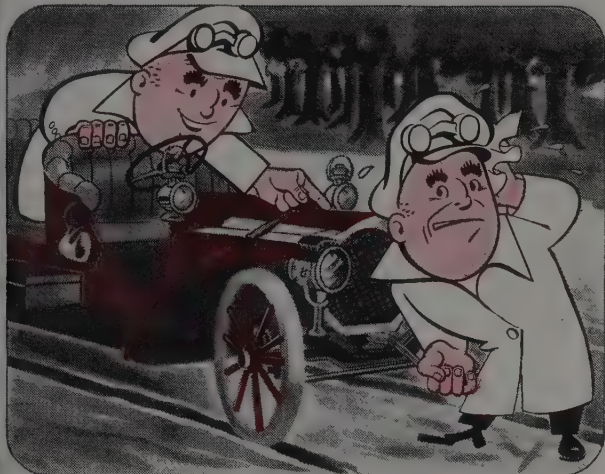
Both the Arc Bonder and the colloidal are used for the repair of cracked blocks. The recommended procedure is to make the arc bonded repair first. If the crack is of any length a plug is used at each end, then the crack is grooved with either a chisel, an electric or air rotary stone, or a pneumatic chisel. This provides a recessed surface on which the arc bonded metal can be laid. After the welding operation, the deposited metal is peened and finished. A special test head is then installed and heated colloidal circulated through the block.

The latter may be accomplished with the Moguloid circulator, or in shops doing a small volume of business the block installed can be circulated by using the cooling system of the car. A pint of colloidal mixed with water is poured in the radiator and heated to about 1750°. This opens up and impregnates any hidden porous areas which may occasionally remain around the welded deposit and at the same time seals pinhole cracks in any other part of the block.

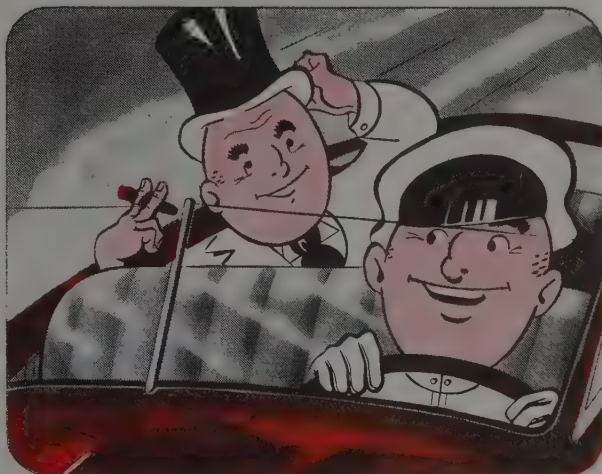


A general purpose inorganic cleaner, mild enough not to harm clothing or skin, is announced for maintenance and other types of work by Pennsylvania Salt Mfg. Co., 1000 Widener building, Philadelphia. Designated as Pennsalt MC-1, the cleaner is a dry, granular material.

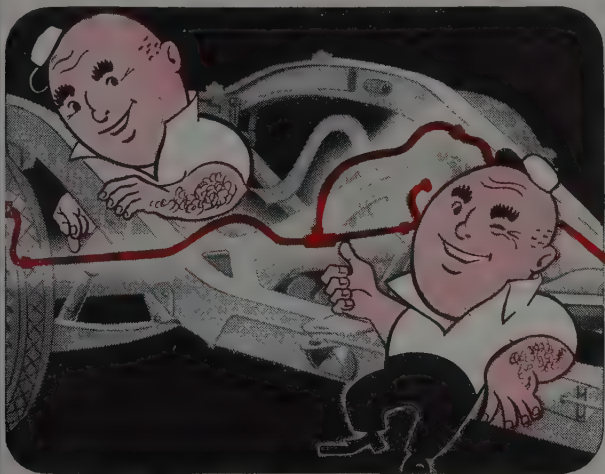
Keeping drivers off their feet



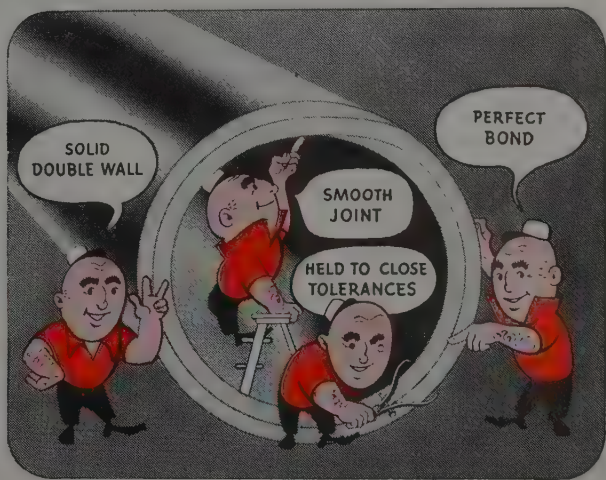
1. NOT too far back in automotive history, an hour's ride was an expedition. Driving took a strong arm on the wheel and a stronger one on the crank. It was never unusual to get out and get under. Mechanical breakdowns were frequent and many a rider was forced to walk.



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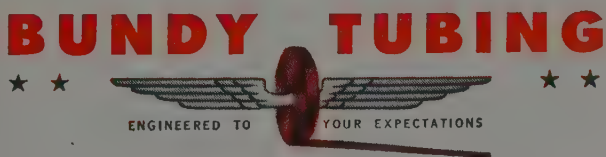


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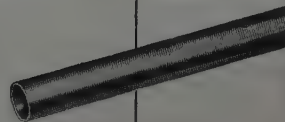
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Disposal of

WASTE PICKLE LIQUOR

May Be Facilitated by Mellon-Developed Process

DISPOSAL of waste pickle liquor, used for removing the oxide scale from steel and aggregating more than 600,000,000 gallons annually in the United States, may be facilitated by a new process developed at the Mellon Institute of Industrial Research, Pittsburgh, it was reported at the American Chemical Society meetings in Atlantic City recently.

Dr. Richard D. Hoak, senior fellow of Mellon Institute, declared that laboratory development of the process, which combines pickle liquor with coke oven ammonia, another waste product, appears to have overcome all the obstacles to the economical treatment of the by-products. More than eighty processes have been proposed for utilizing pickle liquor, but few were operated commercially because virtually all were unsound economically, he explained.

Final economic evaluation of the new process must await study on a semi-commercial scale, Dr. Hoak said, but he called the prospects promising. The process will be applicable only when operated on a large scale, however, so that the small producer of pickle liquor will have to neutralize the waste liquor with lime, or some other cheap alkaline agent, as in the past, he stated.

Disposal of Used Liquor

Disposal of the used pickling liquor, composed of hot sulphuric acid and a concentration of iron salts, has been a problem for many years, Dr. Hoak said.

"The low value of the compounds recoverable from pickle liquor demands that their salvage be accompanied by the simplest possible process and equipment. But hot, dilute sulphuric acid is very corrosive, and high equipment and maintenance costs are occasioned where it must be processed," he stated.

Copperas, a hydrated ferrous sulphate, is the compound most easily recoverable, but the annual demand for it may be satisfied by about 4 per cent of the pickle liquor produced. In addition, it contains 45 per cent water and thus cannot be shipped very far economically. Cost of concentrating free acid in spent liquor is prohibitive, and dilute recovered acid cannot always be recirculated to the picklers.

"The problem of successfully combining pickle liquor with coke oven ammonia attracted research workers because of the logic of using two by-products of steel manufacture to make useful articles of commerce. Ammonium sulphate is regularly made at coke ovens by absorbing the ammonia in sulphuric acid. If the sulphate ion in pickle liquor could be substituted for purchased sulphuric acid, and the iron in the liquor could be converted into an oxide for charging to blast furnaces, a valuable process

would have been developed," he concluded.

Coals used for coke, like some beverages and other products, can be improved by aging, according to a report presented at one of the society meetings by Dr. Ralph E. Brewer, D. A. Reynolds, W. A. Steiner, and R. D. Van Gilder of United States Bureau of Mines, Pittsburgh. Asserting that soft coal begins to change chemically the instant it is first exposed to air in the mine, the report declared that storage for a time that varies according to the particular type of coal makes possible production of better coke.

Reaction of Coal to Oxygen

Limited storage, it is found, may reduce tendency of coal to cake or form incompletely coked masses, but prolonged exposure may result in coke that is "rotten" and too soft for many industrial uses. Some coals react so slowly with oxygen in the air that they may be safely stored for years, whereas others should not remain in storage for more than a few weeks in order to insure a good quality of coke, it was reported.

Good housekeeping in factories is essential to control dust and prevent explosions, Dr. Irving Hartmann of United States Bureau of Mines told the industrial and engineering division in a report which said nearly 900 severe blasts of this type have cost 575 lives, and \$80,000,000 damage in American plants in the last 50 years. In many disasters, the greatest damage resulted from the secondary explosion of settled dust that was thrown into suspension by an initial minor blast, he said.

The chief safeguards against dust explosions are elimination of all sources of ignition from dusty locations: Reducing production of very fine dust as much

as possible; use of inert gas atmospheres in dust-producing equipment when practicable; and good housekeeping to prevent the dissemination of dust outside equipment.

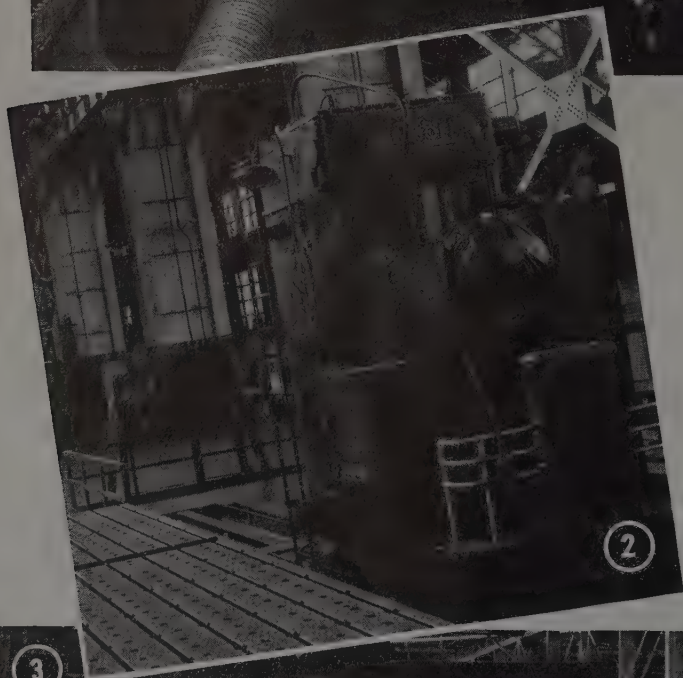
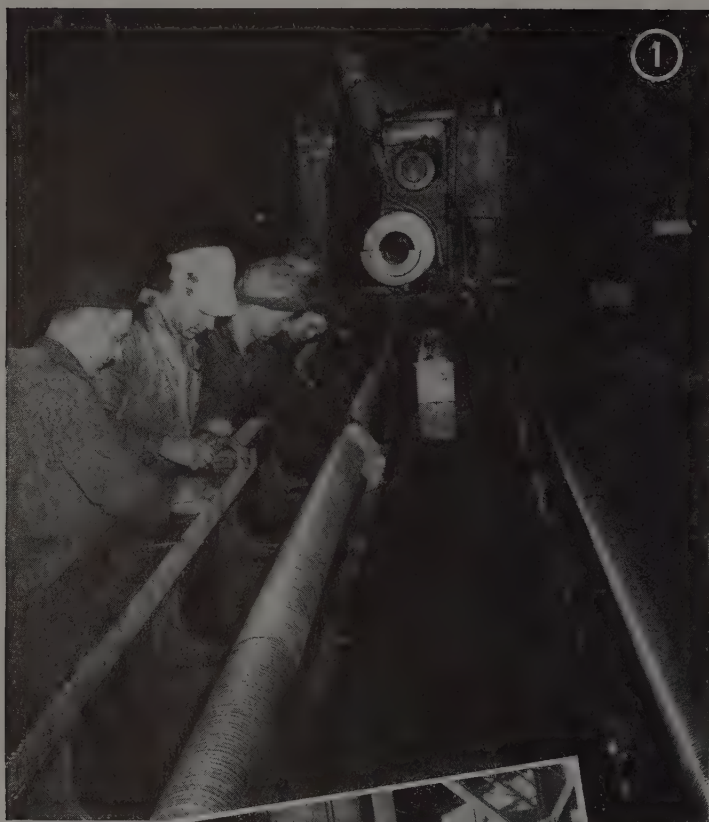
"Explosions are characterized by rapid rise in temperature and by rapid development of pressure, which frequently causes widespread destruction. In general, fine dust particles are more hazardous than coarse dusts. The small particles disperse into the air more readily. They remain in suspension longer, they ignite at a lower temperature, and they burn more rapidly than large particles. However, even relatively large particles of 20 to 30 mesh fineness can take part in explosions.

Few Metal Powders Burn

For most dusts there exists a critical oxygen limit, below which they will not explode. However, a few metal powders will burn and may even explode in an atmosphere of pure carbon dioxide. They include magnesium, zirconium, titanium, and some magnesium-aluminum alloys. Dust clouds of magnesium and of aluminum were also found capable of producing strong explosions in an atmosphere of freon gas."

A new photoelectronic instrument, which can automatically count individual smoke particles or bacteria as small as 25 millionths of an inch (0.000025-in.) in diameter and weighing only four millionths of a billionth of an ounce, has been developed in the chemistry department at Northwestern University, it was reported by Frank T. Gucker Jr., professor of chemistry at Northwestern, before the division of physical and inorganic chemistry. The counter should be useful in detecting dust which must

(Please turn to Page 148)



Stows Away

Navy Ordnance Plant

DETERMINATION that the millions of dollars worth of ordnance production equipment in the U. S. Naval Ordnance Plant, South Charleston, W. Va., shall not rust into uselessness was the motivating force behind the recently let contract for laying up the vast plant. An interior view, showing the plant's 2000 ft machine shop, is shown in Fig. 3. The work, to be carried out by F. H. McGraw & Co., Hartford, Conn., for Carnegie-Illinois Steel Corp., wartime operator of the plant, consists of storing all equipment, tools and building facilities in such a manner that the shops could renew operations almost overnight.

Every piece of equipment—from armor bolt drills and gun lathes to overhead cranes and heat treating furnaces—will be cleaned, greased and protected against detrimental factors. A detail is seen processing a gun lathe, prior to laying-up, in Fig. 1. Other large pieces of machinery such as Ingersoll milling machines (Fig. 2) and Mesta bed planers (Fig. 4) are being processed by McGraw in the plant "storing" operation.

The plant, which during the war years produced some 337,000 net tons, was built for World War I service and was idle for 20 years when McGraw contracted to rehabilitate it in 1940 for use by Carnegie-Illinois. At this time, besides getting the plant into operating condition, machinery was installed, a 3000 ton press (still in its original crates since World War I) was assembled and 20 in. gun lathes were erected. Future utilization will be to store vast quantities of reserve machine tools and ordnance equipment.

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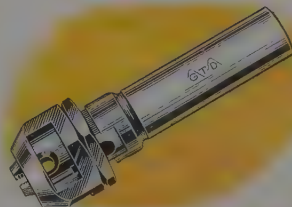


IT LOOKED LIKE AN ACORN

The year was 1909. Throughout the nation, hundreds of new factories were trying to meet the swelling clamor for automobiles, sewing machines, telephones, and a score of other "new-fangled gadgets". There was a need for automatic machines and high-speed methods of production—and a new type of threading die for machine use. GTD "Greenfield" met this need with the

"Acorn" Die. Almost overnight it revolutionized machine threading. Its unique design made it possible to produce precision threads at high speeds. Through the years there have been refinements to its original design, but the "Acorn" Die is today still the standard for accurate, high speed threading on automatic machines.

The "Acorn" Die, so-called because its shape is similar to that of an acorn, consists of prongs of threaded metal projecting from a circular metal base. This is supported in a "holder" which, in turn, fits into the chuck on the machine. The "Acorn" Die is known and used wherever modern screw threading methods are employed.



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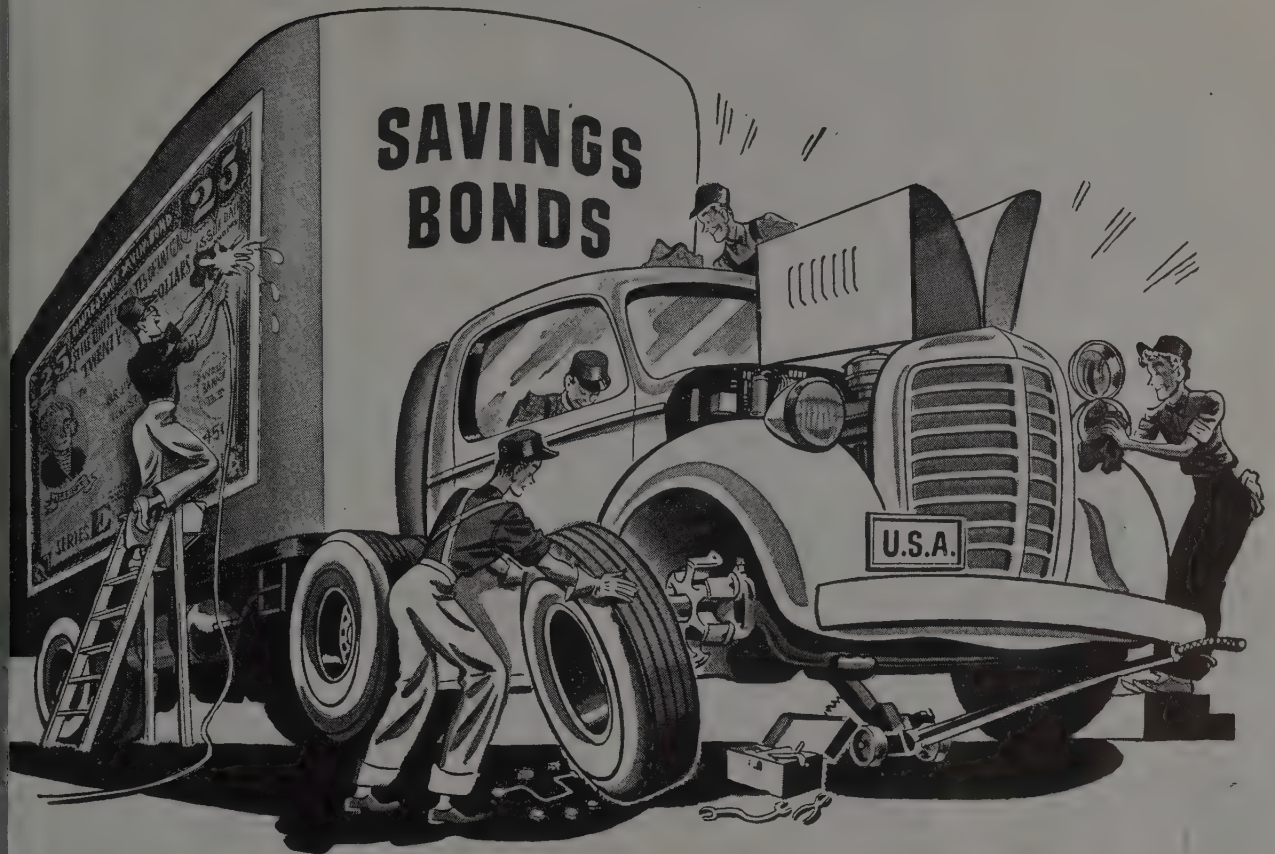
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EIGHT FULL OPEN HEARTH HEATS USED IN

1100-TON MAGNET

FOR NAVY SUPER CYCLOTRON

EIGHT full heats of open hearth steel were cast and formed in the construction of the magnet for the Navy's 200,000,000 electron volt super cyclotron now being built at the University of Rochester, Rochester, N. Y. Scheduled to be completed in the next 2 years, the cyclotron, second largest

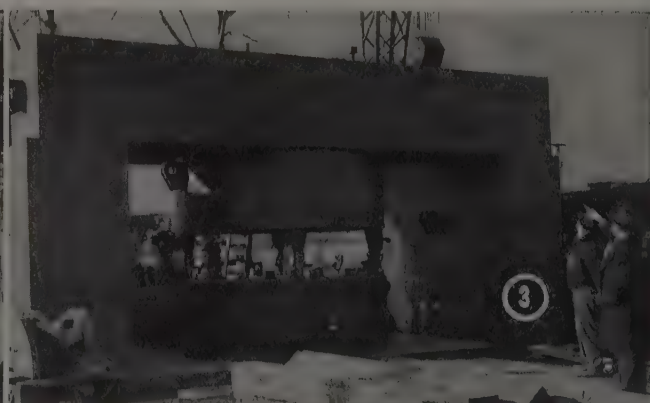
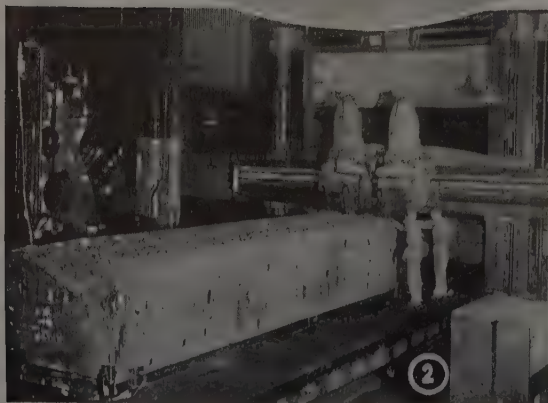
in the United States, will be used for basic research in nuclear physics.

The accompanying photographs illustrate some of the steps taken in the production and assembly of eight solid steel forgings, weighing an average of 150 tons each which form the magnet of the cyclotron.

In Fig. 1, a 7000-ton forging press is shown putting the squeeze on a "baby" ingot to shape a pole piece for the cyclotron magnet. The press, used during the war for forging main drive shafts for the Navy's biggest battleships, is part of the equipment of the Homestead Works, Carnegie-Illinois Steel Corp., near Pittsburgh. One of two identical castings, the pole piece ingot weighed 389,000 lb and was one of two identical castings. Steel is of a mild magnetic composition, containing a maximum of 0.15 per cent carbon.

One of the side members of the cyclotron magnet is shown in Fig. 2 going through one of the nation's largest planers at the Homestead Works. Weight of this piece, as shown painted on its side, is 365,000 lb. After finishing operations it was bolted in place above the pole pieces of the magnet, which, over all, will weigh about 1100 tons, as compared to the 15-ton magnet of the university's present 7,000,000-v atom smasher.

Giant steel blocks are assembled, Fig. 3, to form the magnet, using bolts weighing 440 lb. Finished, the four forgings comprising the base and top weigh 157 tons each, the side columns 125 tons each, and the round pole pieces 90 tons each. While the atom smasher is the property of the Navy Office of Research and Invention, its construction is under the supervision of Dr. Sidney W. Barnes, professor of physics at Rochester, second from right in foreground.



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Merchant Bars

Oregon steelmaker employs double slag in refining electric furnace heats. Eight pouring pits provide for 250 molds. Spreader bar facilitates stripping from four to six ingots from their molds simultaneously

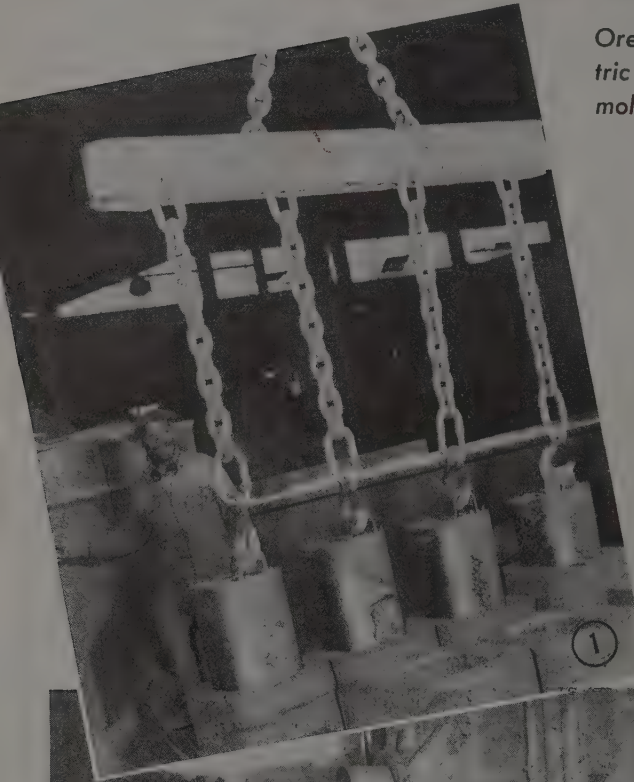


Fig. 1—Ingots are stripped from their molds four at a time

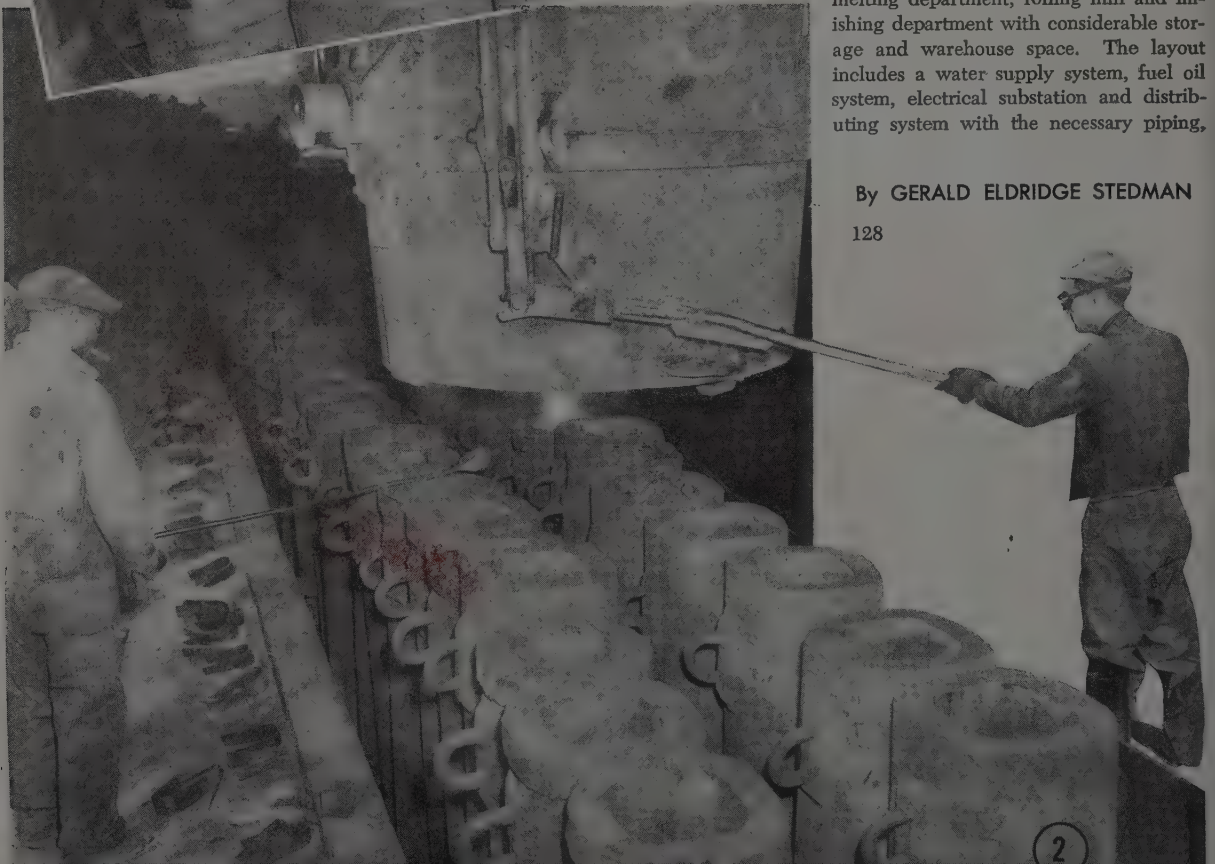
Fig. 2—Heat of electric steel being poured into ingot molds

SOME years ago, Polish emigrants came to Portland, organized the Alaska Junk Co., worked hard and boosted operations into million dollar ratings. Determined that sons should not have to struggle thus, Sam Schnitzer, its president, started a steel mill known as the Oregon Electric Steel Rolling Mills, which evidently grew too fast for it later was purchased by the Hesse-Ersted Iron Works.

Oregon Steel Mills is located on the Willamette river, northwest of Portland proper. The site is served by the Northern Pacific Terminal Co., which connects it with all railroads entering the area. The plant comprises a 1-story administration building, stockyard and craneway of considerable dimensions, a melting department; rolling mill and finishing department with considerable storage and warehouse space. The layout includes a water supply system, fuel oil system, electrical substation and distributing system with the necessary piping,

By GERALD ELDRIDGE STEDMAN

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sewers, tracks, lighting and general plant facilities.

Most of the production is in the SAE range of carbon steels up to 1060, the largest volume being in SAE 1020. Considerable production of SAE 1330 was occasioned during the war for anchor chains. Some production is in resulfurized screw stock of the X1314 and SAE 1112 characteristics. Present melt production is running about 5000 tons per month with the melt shop operating 7 days per week, 24 hours per day.

Four sizes of ingots are produced: 5 x 6 in. weighing approximately 320 lb, 6½ x 6½ in. weighing approximately 540 lb, 54 ingots per heat; 7 x 9 in. weighing 900 lb, 35 ingots per heat; 9½ x 9½ in. weighing 1300 lb, 22 ingots per heat.

Heats average between 15 and 16 tons per furnace, though furnaces are rated 6 tons per hour. Superior melting techniques result in obtaining from two to three extra heats each day. This is due in part to mold efficiency, refractory life and economies.

Oregon Steel's main scrap yards comprise about 14 acres, serviced by nine railroad tracks, pouring into a bank of eleven 25-ft scrap bays for a total dimension of 275 ft, serviced by a crane-way with a 10-ton overhead crane. The activity is facilitated by one steam and one gas locomotive, one steam and one diesel locomotive crane, each 25 ton capacity; handling operations are facilitated by magnet lift. Scrap storage accounts for about 3500 tons, prepared and unprepared. Preparation consists of torch cutting or shearing to 5 ft lengths and under. The 11 bays of the scrap bank conform to lot numbers which are determined by grades and analysis.

Melting furnaces receive a primary and secondary charge, load formula depending upon the class of scrap. Usually, the load is about 10 per cent steel turnings, 25 per cent heavy scrap and the remaining fill-in with automobile and miscellaneous scrap. In many heats, the charge is semikilled.

Two Lectromelt furnaces rated 6 tons per hour operate continuously. The furnaces have an 11-ft diameter shell, are

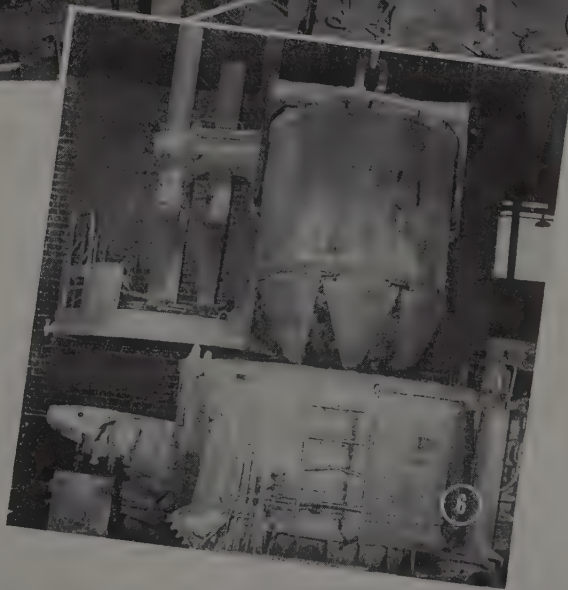
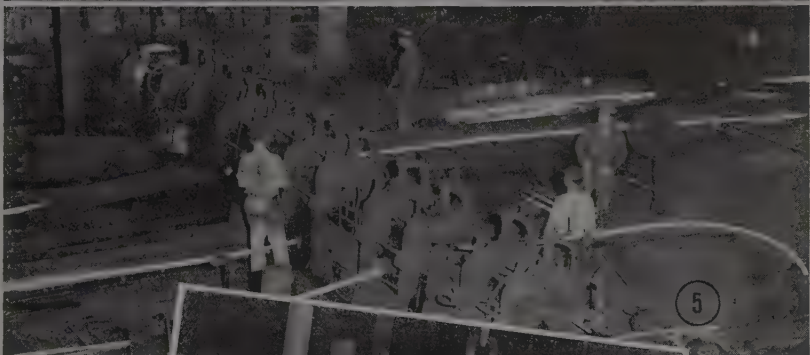
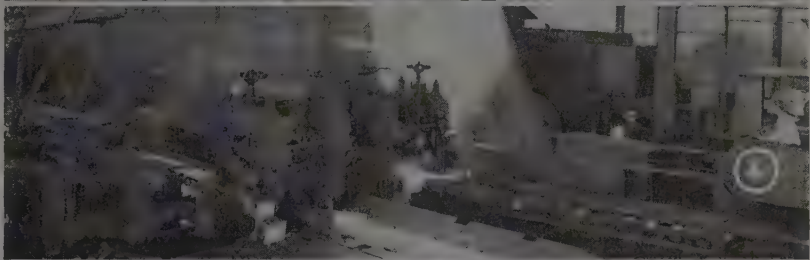
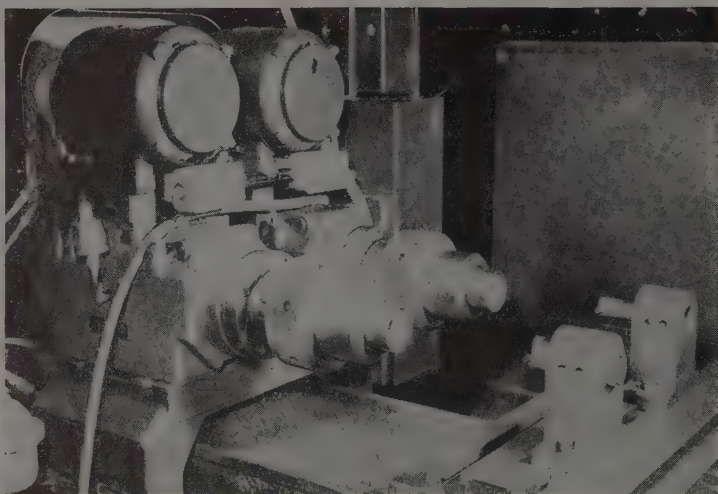


Fig. 3—Bundling and sorting racks in shipping department
Fig. 4—Ingot entering roughing mill at right and billet entering strand rolls at left
Fig. 5—14-in. guide mill working on rounds
Fig. 6—Electric furnace is top charged by drop-bottom buckets
Fig. 7—Ingots racked preparatory to charging into heating furnace. Melt shop is shown in distance



MEETS SPECS: Concentricity between individual bores and outside diameter on these bushings was held within 0.0005 total indicator reading, and concentricity between bores to 0.002-in. using a No. 701 air-operated face chuck made by Erickson Tools Division of Erickson Steel Co., Cleveland. Production is said to have increased 50 per cent, scrap loss diminished from 13 to 1 per cent, and operator fatigue practically eliminated

top charged and each are serviced by a 5000-kva transformer. Normal melt is 15 to 16 tons per heat. Oregon Steel uses two charges: The first making up about three-quarters of the heat, and the second the remainder. Average heat is 2 hours 15 min. Power consumption is between 480 and 500 kwh per ton.

Electrode consumption is 8 to 10 lb per ton. Heats are poured through 1½ to 1¾-in. nozzles. Effort is made through outside purchases to maintain an ingot backlog, permitting stocking all SAE numbers up to No. 1060.

Ingot molds are top poured in eight concrete pits having a capacity of 250 molds. Pouring technique is standard. A hairpin made from 1½ to ¾-in. flat is cast into the top of each ingot mold for stripping purposes. A spreader bar is used to pull four, five, or six ingots, depending on their size. Ingots are racked on railroad rails, and transferred in units to the ingot storage yard.

A 74-ft extension to the melt shop building connects an open craneway extending approximately 150 ft beyond the building. This houses additional pouring pits and provides adequate storage for a normal inventory of ingots. Railroad tracks run under the craneway extension to provide facilities for handling an excess storage of ingots or to receive ingots purchased from outside sources. A fair-sized ingot inventory is needed to accommodate the requirements of the rolling mill in size, grade and quality.

Present melt shop building is 240 ft long, comprising a main bay 65 ft wide

with a 30-ton crane and a leanto 38 ft wide on each side. The leanto houses an adequately equipped laboratory and provides storage space for supplies. Samples and tests are made during each heat, and although the heats are racked as units, each ingot carries a metal tag to identify its heat number.

A log of heat No. A-3155 follows:

Charge included 28,020 lb of plate and an estimated 20,000 lb of black bundles.

Previous heat was tapped at 3:40 p. m. Patching time was 15 min.

First charge in at 4:08 p. m. with power on. Second charge was dropped at 5:15 p. m.

Samples taken and slag built at 6:10 p. m. using 400 lb burned lime, 400 lb fluorspar and 30 lb petroleum coke.

Before tapping a flash test of 16 sec was taken and the carbon meter showed the samples 0.18 to 0.19 respectively against specification for mild steel permitting 0.15 to 0.25.

Alloy additions were: 105 lb FeSi, 70 lb SiMn and 7½ lb aluminum.

Following alloy additions, ladle sample taken to insure close analysis within specification.

Heat tapped at 6:40 p. m., Tapping temperature 2940° F., teeming temperature 2780° F.

Temperature of each heat is recorded and where necessary held to insure proper pouring temperature to secure optimum quality of the finished ingot.

Heat poured into 34 molds, 7 x 9-in. This particular heat was No. 54 on the furnace roof, No. 174 on the furnace lining and No. 376 on the furnace bottom.

The kw consumption for entire heat was 7200 and time of heat 2 hours 32 min.

Practice indicates that from 110 to

120 heats are obtained per furnace roof. From 250 to 280 heats per lining are secured. Between 1500 and 1800 heats from bottoms before replacing magnesite.

Four voltage taps serve the furnace. The high tap A is 250 v and the taps step down in about a 50-v sequence to D-tap having 115 v. The practice is to start the operation on C-tap, using 150-v until the electrodes have buried themselves sufficiently to protect the roof from long arc and oxide splashing. Then the furnace is put on A-tap to melt down as closely as possible to 100 per cent of transformer capacity until the scrap starts falling away from the walls. Then the taps are dropped down to protect the furnace refractories. When the final scrap is in, the melters have reached D-tap.

Metal Sample Taken

At this point, a slag and metal sample is taken by test spoon. The metal sample is analyzed for C and Mn. From this sample is also obtained an indication of the temperature of the heat. From the appearance of the slag sample, it is determined whether it is necessary to build a second slag. Normally, the second slag is built containing enough reducing properties to convert the first slag to a semireducing state. However, in some cases the first slag is so highly oxidized that this is impractical. In such cases, the first slag is removed, and the second slag built. After the second has reached a semireducing state, another test is taken and from this the quantities of ferroalloys are calculated which are necessary to bring the melt to the required specifications.

Given the perpetual ingot inventory, the rolling mill superintendent provides rolling sequence, the sales department supplies order records. From these data, the rolling schedule is formed. This is cleared with all department superintendents.

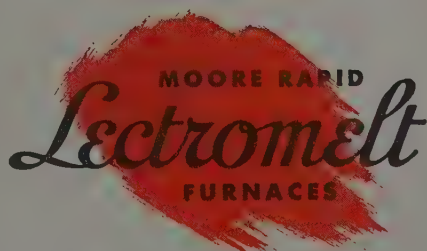
Ingots are charged into the rehear furnace of the rolling mill to conform to this schedule. This is a double row, oil-fired top and bottom, continuous rehear furnace with a capacity of 35 tons per hour. Normal rolling temperature is 2200° F. Pressure indicators are installed to check primary and secondary air as well as oil-line pressure. Ingots are pushed through this furnace in not less than a 2½-hour cycle. Periodic CO₂ tests indicate the flue gas content and by this measurement waste is prevented in fuel and excessive metal oxidation.

From the hearth of the rehear furnace, the billet to be rolled drops on a conveyor, which moves it to the tilt table of the 20-in. mill. Five to nine passes



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are made on the roughing stand, depending on ingot size and section rolled.

The selective range of this mill includes $\frac{5}{8}$ to 2½-in. rounds, 1½ x 1½ x 3/16-in. to 3 x 3 x ½-in. angles, half-rounds from 1 to 3 in. and flats from 1½ x ¼ to 6 x 1 in.

The rolling mill building, 696 ft long and 84 ft wide, is serviced by two 15-ton cranes. It contains a 3-stand 20-in., a 5-stand 14 in. and 2 stand 9 in. mill.

From the 20-in. roughing mill, the work goes to the strand rolls of the 20-in. mill, usually receiving two passes, and then is conveyed to crop shears

where it is cut in specified lengths. The work then proceeds to the 14-in. mill where it normally is given three passes on the first stand and one pass on the succeeding stands of this 5-stand mill; ¾-in. round and under require two additional passes on the 9-in. mill.

Work is conveyed from the last finishing stand to the 175-ft automatic hot-bed. Bars trip progressively over the notches of this hot bed, dropping off on a conveyor to shears where they are cut to dimension and are transferred in 5-ton lots by a crane to the bundling racks.

The first finishing bay of the warehouse involves shearing, bays 2, 3 and 4 are for hot laying, and bays 5, 6 and 7 take care of weighing, bundling and straightening. Steel is sheared while still hot, laid down until it can be manually handled, and moved by 10-ton crane to straightening machines and bundling racks. After sorting, straightening, bundling and inspection, it is moved out by truck or railroad cars. The yard is serviced by eight railroad spurs, one steam and one gasoline locomotive, and one steam diesel crane, both magnet equipped.

Use of Files

(Continued from Page 105)

the rasp produces an extremely rough cut. Single-cut curved or wavy tooth types are good for flat surfaces, aluminum or steel sheets. Obviously rough, coarse and bastard cuts are employed on heavier work, while second cut, smooth and dead smooth are utilized for more exacting metal removal and finishing; actually rough and dead smooth are seldom included in general use of files.

General Purpose Group: In the general-purpose group, machinists' files are double cut, the group including flat, hand, round, half-round, square, pillar, three-square, warding knife and scattered less known kinds. Widely used, a flat machinist's file is of rectangular cross-section, slightly tapered toward the point in both width and thickness, cut on both edges and sides. Hand files are similar to the flat, but parallel in width, tapering in thickness only. For finishing flat surfaces one edge is uncut or "safe."

Half-rounds have one rounded side, the back, and one flat side; latter is always double-cut, and rounded sides usually are, except smooth and some second cut types which are single-cut. In both width and thickness half-round files taper toward the point. For circular openings or curved surfaces, round machinists' files are made in both tapered and blunt shapes. The square file is employed for filing slots, keyways and general surfacing; because of its heavier cross-section and four filing sides, the square file in larger sizes is preferred to the flat for some purposes.

With a rectangular cross-section, the pillar file resembles the hand, but is thicker and narrower with one uncut edge; used also for slots and keyways. For acute internal angles, clearing flat corners and for filing flats and cutters, a three square file is double-cut, with edges left sharp and cut. Tapering to a narrow point as to width, the warding file is rectangular in section and used by

locksmiths in shaping notches in keys and locks. Tool and die makers, with work at acute angles, are principal users of the knife file, one with a knife-blade section. With coarser teeth, but distinguished from wood rasps, wood files are made in same sections as flat and half-rounds; teeth are designed especially for wood, although in the machinists' group.

Mill Files: Mill files have many uses, but notably for sharpening mill or circular saws. Mill files are also used for sharpening large cross-cut saws, moving machine knives, drawfiling, lathe work, on compositions of brass and bronze and for smooth finish.

Single-cut mill files are tapered slightly about one-third of their length, mostly with two square edges with cuts, as well as on the sides. To prevent sharp corners or edges on gullets of cross-cut saws, some have one or two round edges. Blunt mill files are also used for sharpening cross-cut saws, buck-saws and for general filing.

For sharpening all types of saws with teeth of 60-degree angle, tapered triangular saw files are furnished in various thickness of taper, slim taper, extra slim taper and double extra slim taper. Blunt triangular files in this category are favored by filers of carpenters' saws and these also are available in various thicknesses.

Saws with less than 60 degree angle teeth may frequently be sharpened with cant saw file. The "M" or raker teeth of crosscut saws are also sharpened with the cant saw file. However, the special crosscut file, which has the same shape as a mill blunt bastard, is used for sharpening the cutter teeth of crosscut saws. For deepening the rounded gullets of crosscut saws, another file, the Great American style, is selected.

Rasp teeth are individually formed, disconnected from each other, and the cut differs from both the single and double-cuts of files. With a larger radius the curved side is similar to that of the half-round file. Made in both round and

flat shapes, rasp cuts are not so extensively used for metal cutting, but are important tools for carpenters, shoemakers, plumbers, horseshoers and others working on relatively soft materials for fast removal.

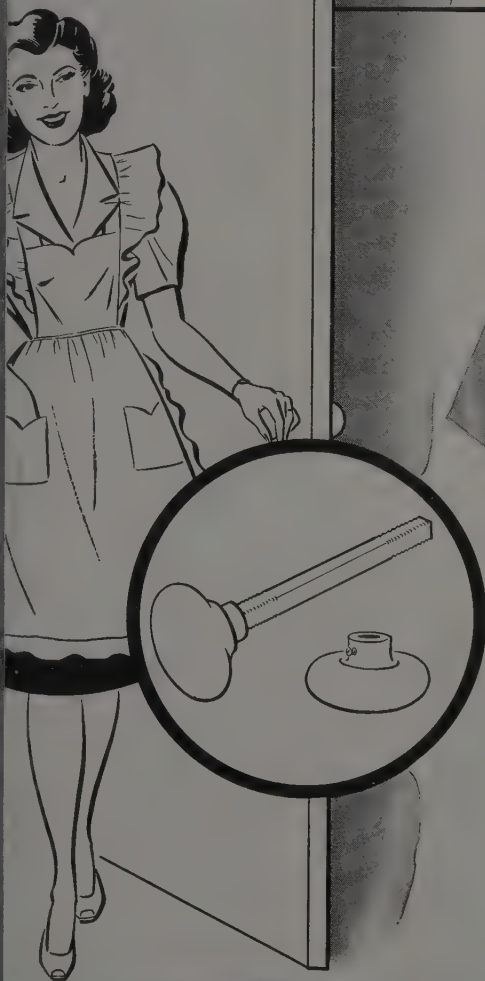
Swiss Pattern Finishing Tools: Produced to more exacting tolerances and measurements than American pattern groups, Swiss pattern files constitute a vast field of their own in precision filing. Tool and die makers, finishers of delicate instrument parts, jewelers, model-makers and metal craftsmen are leading users of these tools.

Shapes differ in Swiss and American pattern files, although cross-sections of both types are similar in some cases. Smaller points with longer tapers are Swiss characteristics; cuts are much finer, from No. 00, coarsest, to No. 6, finest. Primarily finishing tools, finer cut files are used for removal of burrs from previous finishing operations, truing narrow grooves, keyways and notches, rounding slots, filing corners and smoothing small parts.

With many multiplied by a range in sizes, Swiss pattern files are produced in about 100 additional shapes. Commonly classified are Swiss pattern half round, double-cut on both flat and half round sides; Swiss square, double-cut on four sides, narrower and longer tapered than the comparative American pattern; Swiss round tapered, double-cut; also blunt, again narrower and longer; Swiss pattern pillar narrow, double-cut on side with edges "safe" or uncut; Swiss knife file, double-cut sides with single-cut edges, tapering to point in width and thickness with knife-shaped crossed section at 10 degree angle; Swiss three square, double sides, single-cut edges with narrower and longer taper than comparable American. The latter also comes in blunt shape while other Swiss patterns are grouped or classified as: Square and round handle needle; die sinkers; parallel and bench filing machine; broach; corrugating; joint; slitting; pipping; crossing; screw head; cant; equal-

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ling; warding; silversmiths' rifflers; and barrette files.

Having considerable range of shape and structural characteristics, curved-tooth files are designed for many special applications and have a distinct niche in metal removal by filing. Often used on steel, curved-tooth tools are specially adapted for filing of soft metals, brass and babbitt, also steel and steel sheet, flat or curved surfaces, Fig. 5.

With correct rake for speed and economy, curved teeth readily clear of chips. This type of file is prominent in the automotive industry, both manufacturing and repairs. Standard, fine and smooth cuts are designed into curved-tooth files in parallel flat, square, pillar, pillar narrow, half-round and shell types. This file is made in both rigid and flexible forms, the former either tanged for a handle or plain with holes punched at each end for use in special holders.

Alloy steels and flexibility in design have marked strides in development of curved-tooth files, some of them recent. Chromium-vanadium alloy steel is used for some types and, while originally engineered for soft base metals, satisfactory cutting on harder steels is now common.

The Nicholson File Co. Super Shear, a curved-tooth file that smooths as it roughs, has teeth cut in an arc off center in relation to the axis. For fast cutting, this permits teeth to begin with wide gullets and a right angle which become shorter and closer together, terminating in a long shearing angle, thus producing a smoothing effect.

Usual working direction in filing metal with Super Shear file is right-toward-left and an overlapping stroke with this curved tooth file clears its own tracks on the metal surface; in effect this is a double purpose milled tooth for wider application on flat or convex metal surfaces—brass, bronze, aluminum, copper,

magnesium, babbitt, cast iron, soft metal alloys, plastic or hard rubber. Number of teeth per inch, ranging from eight to 14, depends as in other types, on length, coarseness and design of cut.

(Continued next week)

APPENDIX I FILE NAMES

Aluminum "A": Special-cut file for work on aluminum stock or castings.
Auger Bit: File with double ends (each with different cut) for sharpening auger bits.
Brass: File for use on brass and similar soft metals.
Broach: Jewelers' steel-wire files of many gages.
Cabinet (File or Rasp): Used by cabinetmakers, wood workers.
Contact: File for dressing "make-and-break" points of electrical circuits (also called tungsten).
Corrugating: File made for corrugating the edges of barbers' shears and other edged tools.
Crosscut: File for sharpening cross-cut saws.
Die Cast: File for use on aluminum or zinc castings.
Die Sinks: Files, of various shapes, used by die makers.
Double Ender: Saw file cut from the points toward the middle—for filing from either end.
Foundry: File used on castings formed from foundry molds.
Hand: Double-cut file with parallel edges and tapering thickness.
Handsaw: Triangular file (see slim taper) for sharpening handsaws.
Knife: File whose cross-section resembles the blade of a knife—thick at one edge, thin or sharp at other.
Lead Float: Single-cut file for use on lead, babbitt, other extra-soft metals.
Machine: Files used in filing machines.
Machinists': Applied to various shapes of files, mostly double-cut, used in machine, repair shops.
Mill: Single-cut (tapered or blunt) file which acquired its name from its early use in filing mill or circular saws.
Needle: Files of many shapes, used by tool and die makers, also by watch and clock makers.
Pillar: Parallel-edge file with rectangular cross-section of narrow width and extra thickness.
Pippin: File with a cross-section resembling a pippin (apple) seed.
Pitsaw: File used for sharpening pit or frame saws.
Plastic: Files, of various types, used in flash removal and other finishing work on molded plastic products.
Rifflers: Fine-point and vari-shaped files used by die sinks and silversmiths.
Screw Head: File for clearing out the slots in the heads of screws.
Shear Tooth: Coarse, long-angle, single-cut file.

Slim Taper: Triangular file, slenderer than the regular taper, used mainly for handsaw sharpening. Also extra slim taper and double extra slim taper.

Stainless Steel: Special-cut file for use on stainless and other extra-tough steels.

Swiss Pattern: Large series of files of various shapes and a range of cuts of their own, designed principally for precision work in the jewelry, die-making, silversmith-clock-making, watch-making and other industries.

Taper: Used to denote the shape of a file as distinct from blunt. Custom has also established it as a short name for the triangular handsaw file.

Three Square: File whose cross-section is triangular. Usually applied when such file is double-cut.

Warding: File named after its original or most common use—filing ward notches on keys and locks.

APPENDIX II FILE TERMINOLOGY

Back: Convex side of half round, cabinet, pitsaw and files of similar cross-section.

Bastard Cut: File coarseness between "coarse" and "second cut".

Bellied: Describes a file having a fullness in the middle.

Blank: File in any process of manufacture before being cut.

Blunt: Used to describe a file with parallel edges and sides; i.e., which preserves its sectional size throughout from point to tang.

Coarse Cut: Coarsest of all cuts.

Curved Cut: File teeth in curved contour across the file blank.

Cut: The character of a file's teeth with respect to coarseness (coarse, bastard, second cut, smooth, dead smooth) or their type (single, double, rasp, curved, special).

Dead Smooth Cut: Finest of the standard cuts of regular files.

Double Cut: A file tooth arrangement formed by two series of cuts,—overcut, followed, at an angle, by the upcut.

Filing Block: A piece of hard, close-grained wood having grooves of varying sizes upon one or more of its sides. Used for holding small rods, pins, etc., in the jaws of the vise while being filed. Also a block of zinc, copper or other fairly soft metal as one of a pair of "protectors" placed between the vise jaws to prevent work becoming damaged while being held for filing.

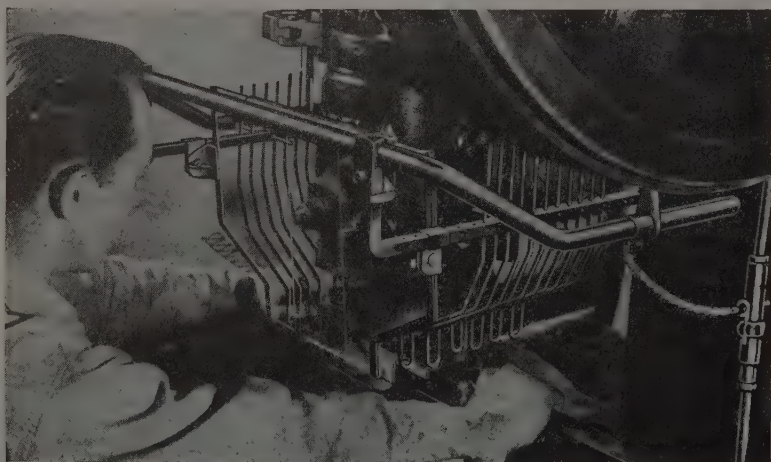
Float: Sometimes used to refer to the coarser grades of single-cut files when cut for very soft metals (like lead) or for wood.

Hopped: A term used among file makers to represent a wide skip or spacing between file teeth.

Overcut: First series of teeth put on a double-cut file.

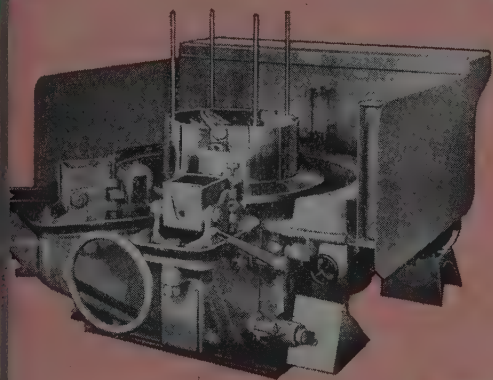
Point: Front end of a file.

Rasp Cut: A file tooth arrangement under which teeth are individually formed, one by one, by

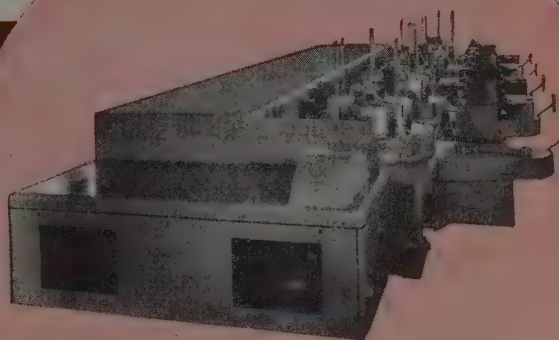


PRESS PROTECTION: Built to fit power presses used in blanking operations, this new safety guard features a protective Plexiglas shield which provides an unobstructed view of the work. Manufactured by Junkin Safety Appliance Co. Inc., Louisville, the shield is shatter-resistant and splinter-proof, protecting operator from flying metal particles. Shield can be swung up and out of the operating position to allow adjustment of press. Rohm & Hass photo

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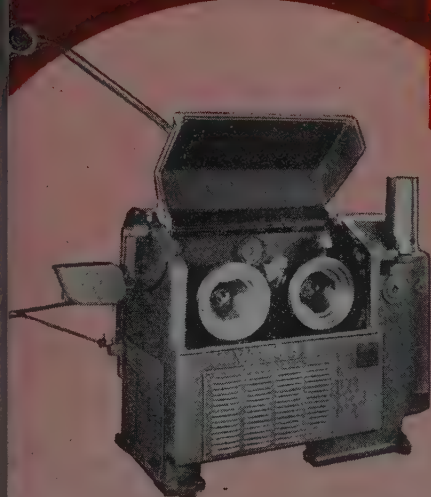


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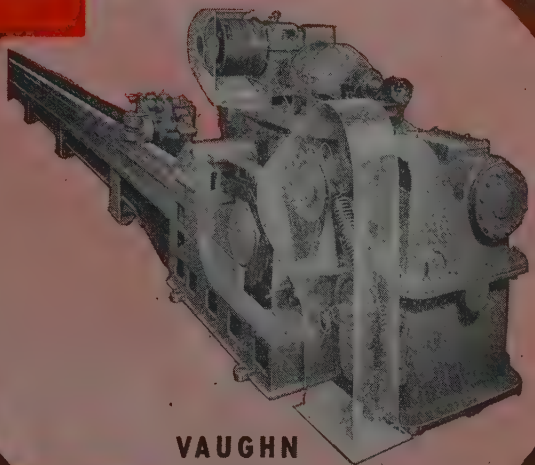


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means of a narrow, punch-like chisel.

Re-Cut: A worn-out file which has been re-cut and rehardened after annealing ("softening") and grinding off the old teeth.

Safe Edge (or Side): Used to denote that a file has one or more of its edges or sides smooth or uncut, so that it may be presented to the work without injury to that portion or surface which does not require filing.

Scraping: As applied to machine shops, the process of removing an exceedingly small portion of the wearing surfaces of machinery by means of scrapers, in order to bring such surfaces to a precision fit or finish not attainable

by ordinary filing means.

Second Cut: File coarseness between "bastard" and "smooth".

Section (or cross-section): The end view of a file if cut off squarely at the greatest width and thickness from its tang.

Set: To blunt the sharp edges or corners of file blanks before and after the overcut is made, in order to prevent weakness and breakage of the teeth along such edges or corners when file is put to use.

Single Cut: A file tooth arrangement formed by a single series of cuts.

Smooth Cut: File coarseness between "second

cut" and "dead smooth."

Superfine (or super) cut: The British equivalent of the file cut which American file manufacturers term "dead smooth."

Tang: The narrowed portion of a file which engages the handle.

Taper: Used to denote the shape of a file, as distinguished from the blunt. Custom has also established it as a short name for the triangular hand saw file. Graded variations are slim taper, extra slim taper and double extra slim taper.

Upcut: The series of teeth superimposed on the overcut, at an angle to it, on a double-cut file.

Steel Casting Practice

(Concluded from Page 112)

runner could be materially shortened—by 5½ lb, to be exact—thus increasing the yield of actual casting from 55 to 59 per cent of the melt.

Prior to the redesign, the weight of metal in the mold was 90 lb, of which 40 lb or 45 per cent was sprue-and-runner. Afterward, total weight was cut to 84½ lb of which sprue-and-runner accounted for 34½ lb.

Another leading example, Fig. 3 recently was the shifting of a gate on a crankshaft from the bearing to the arm, which eliminated the porosity that had been the principal source of difficulty in getting into production on this particular product.

Classic case of redesigning the product to suit the process, Fig. 6, is found in the jack base—part of Auto Specialties' own line of products.

Here, porosity persistently occurred in a spot near the gate, and no amount of gate-shifting seemed to help. Finally, it was proved that this problem was not due to gating at all, but to the difficulty experienced by the metal inside the mold in flowing through a narrow section. By creating a small channel or web connecting two protruding sections of the casting, this trouble was eliminated entirely. An effort was then made to weld those bases of the old design in order to eliminate the porosity. The radiographs showed, however, that welding was not quite good enough to salvage these items. They were scrapped.

Radiography has made it possible to execute radical changes in crankshaft design—such as the casting of crankshafts with hollows partially or completely through the center shaft and/or the bearing area, Figs. 7 and 8. Only by the closest control and observation of results has it been possible to develop proper molds and pouring technique for this purpose. In one case, because of these reductions in metal content, an unfinished cast crankshaft for a certain automobile weighed 1 lb less than did a finished shaft, produced by another process which did not permit incorporation of the hollows.

Use of x-ray enables foundrymen to invade many fields and attempt many

changes in product design that they would not dare to attempt without it. Changes in design are easy to visualize. Designers may even be able to predict theoretically in advance that the new shape will withstand all the necessary strain. But one of the most difficult things to determine is how the new shape can be successfully cast without a prohibitive proportion of excess metal to feed it, and without developing hot tears, shrink, porosity and blows in strategic locations.

Radiographic findings often reach as far back as the melt. In one case, Fig. 9, it was shown the cause of pinholes was improper de-oxidation of the melt due to addition of insufficient aluminum. In another case, that the core was too hard, resulting in hot tears or trapped gas. In still another, that the core was soft and metal had burned in, necessitating too much grinding.

Use of Radiographic Findings

In one instance, by correlating its strength tests with radiographic findings, the firm was able to produce one of its products from malleable iron without sacrifice of durability or soundness of the casting.

One auto manufacturer who needed an unusually small crankshaft, found that he could have it cast, after rapid radiographic studies proved the soundness of the pilot lot. This shaft later withstood 50 hours of testing at 7000 rpm.

As mentioned previously, most crankshafts are x-rayed at a 10-ft target-to-film distance; jack parts, and other smaller items are sometimes done at shorter distance. Between 0.090 and 0.100-in. of lead sheet is used as a filter for soft x-ray between the product and the film, and 0.010-in. of lead sheet is placed behind the film to absorb scattered radiation, and to increase the sharpness of the image. Fine-grain, Eastman A film is used. A large ¾-in. sheet of lead serves as a "platform" on which all work is done. This reduces back-scatter to a minimum. Usual exposure time for a group of crankshafts is 6 to 8 min.

To provide complete protection for personnel, the x-ray equipment is placed in a room that is 25 ft wide, 45 ft long and 35 ft high, with three walls 18 in. thick and the fourth wall (which faces the con-

trol room and office) 24 in. thick. This thickness extends to a height of 18 ft, then drops back to 10 in. Entire building is of concrete and is heated by radiant pipes in the floor. A large electrically-controlled concrete door permits passage of large apparatus from the x-ray room.

A crane mechanism permits the x-ray unit to be manipulated over a length of 38 ft, a lateral distance of 21 ft and a vertical travel of 18 ft.

Allowing for 8-min exposures, and 8 min to make a setup for six crankshafts, Auto Specialties can examine 24 crankshafts per hour, which is more than ample at present. This is a maximum figure which is not always necessary to attain, particularly after a pilot lot has been studied and only spot checks need be made on subsequent lots.

Average production now is 2500 to 3000 crankshafts for a 16-hour day. Plans now are under way to increase operations from two shifts to three, as soon as personnel is available. In addition, a plant for hydraulic jack and Lambert disk brakes, was recently completed at Hartford, Mich.

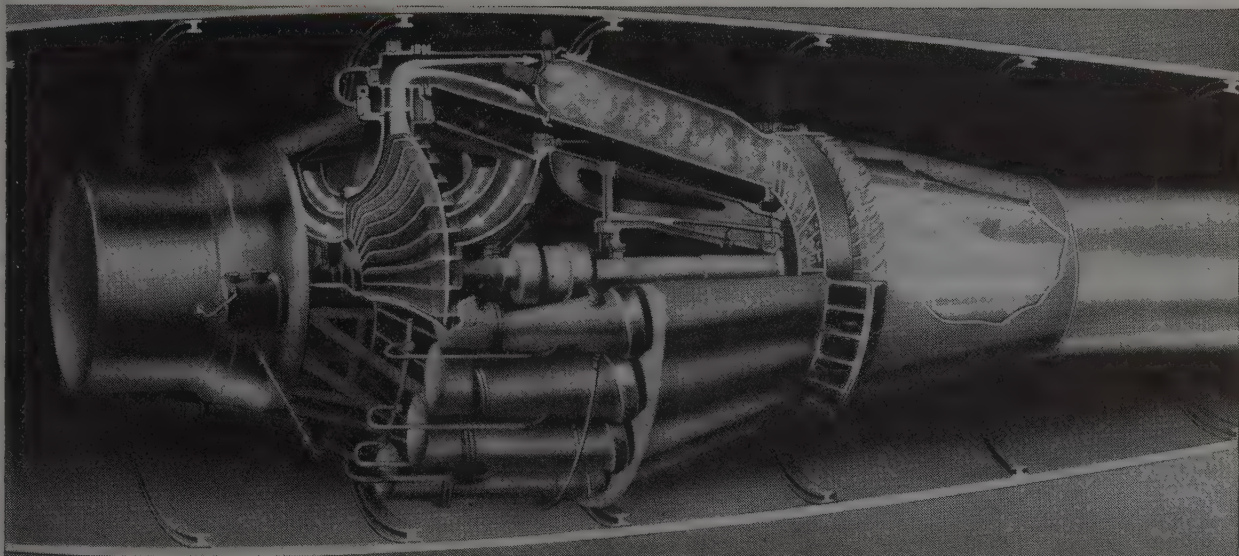
"Guided at every step by x-ray studies and rechecks, the casting of metals has progressed to the point where it offers distinct advantages," according to W. V. Tescornia, vice-president of Auto Specialties.

"Casting to exact dimensions often reduces machining time considerably. Cast crankshafts contain free graphite, which provides 'built-in' lubrication, dampens motor vibration and improves wearability. In addition, it is easier to harden bearings and bearing surfaces through heat treatment.

"Another advantage is that steel of high carbon content (1.50 per cent carbon) can be used—steel which could not be handled by other methods.

"Castings," he points out, "lend themselves easily to new designs. Of particular importance are those designs which eliminate weight. An outstanding example, is a new type of pancake crankshaft, about which little can be said now except to indicate that its production would be impossible by any other method. This trend toward lower weight, especially in crankshafts is motivated by the increasing demand for motors of high speed, torque and efficiency."

"16-25-6" made jet propulsion possible



...what can it do for you?

CHIEF obstacle to the early development of jet propulsion was lack of a steel for the turbine rotor which could stand up under the terrific heat and forces involved.

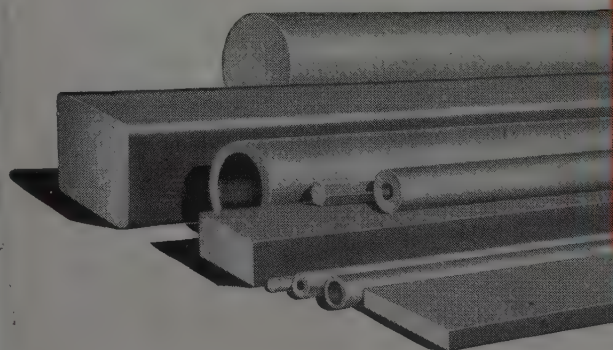
During World War II, The Timken Roller Bearing Company produced the answer in "16-25-6." It was first used for the rotors of turbo-superchargers, where it retains amazing strength while heated red-hot by blasts of gases as hot as 1700°F.—and while spinning at 30,000 r.p.m.!

Just as it opened new horizons in aviation, this new

steel may hold the key to new opportunities for you. In addition to its astounding performance at high temperatures, "16-25-6" has excellent weldability, good forgeability and machinability, and stubborn resistance to scale and corrosion.

As specialists in alloy steels, the Timken Company had the experience which made development of "16-25-6" possible. We will be glad to put this same experience at your disposal in selecting the steel best suited to your individual needs. Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

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Fine Alloy

STEEL

and Seamless Tubes

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14 PORTER

Diesel-Electric LOCOMOTIVES

SPEED PRODUCTION... IN LARGE STEEL PLANT



Fourteen Porter Diesel-Electrics are now in service at the Carnegie-Illinois Steel Corporation's Homestead Works: six 35-ton and six 60-ton 30" gauge units, one 65-ton and one 80-ton standard gauge unit.

Porter Diesel-Electrics have proved their economy and reliability in steel plant haulage—the toughest service ever asked of switching locomotives. Because of their rugged construction and many advanced features of design, Porter Diesel-Electrics provide practically 100% availability.

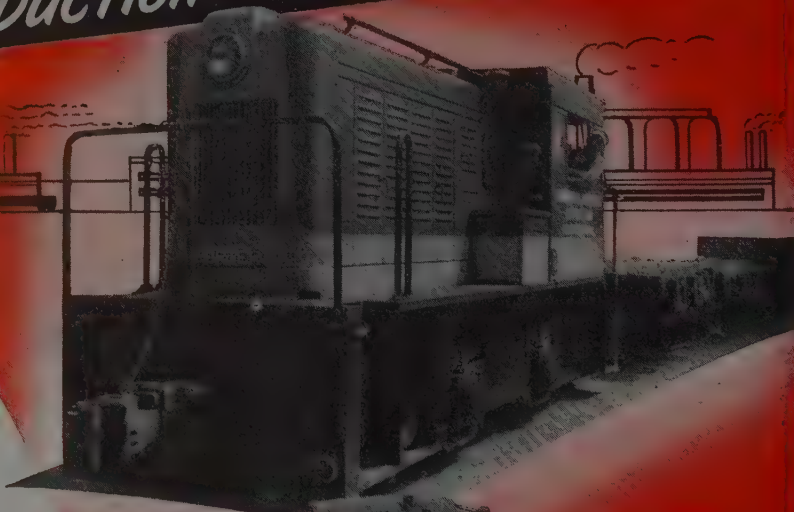
Porter engineers will be glad to survey your haulage problems and recommend the type of switcher best suited to your own particular requirements.



60-Ton, 30" gauge

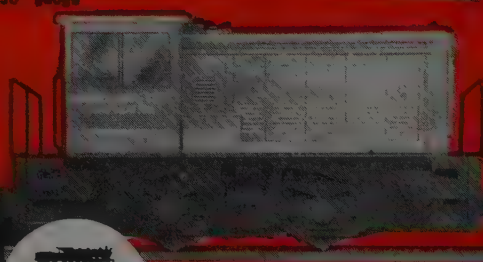


65-Ton, standard gauge



80-Ton, standard gauge

35-Ton, 30" gauge



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PITTSBURGH 22, PENNSYLVANIA

District Offices in Principal Cities

PORTER
Better Built
Equipment
Established 1886

**Porter-Built means
"Better-Built"**

Electrostatic Spraying

(Continued from Page 106)

work has a charge imparted to it of the opposite polarity so that the spray is attracted to the work. By "guiding" the sprayed finish material onto the work in this manner, the two very important benefits, (1) adequate and even coverage with a (2) minimum loss of paint from overspray, are realized by the finisher.

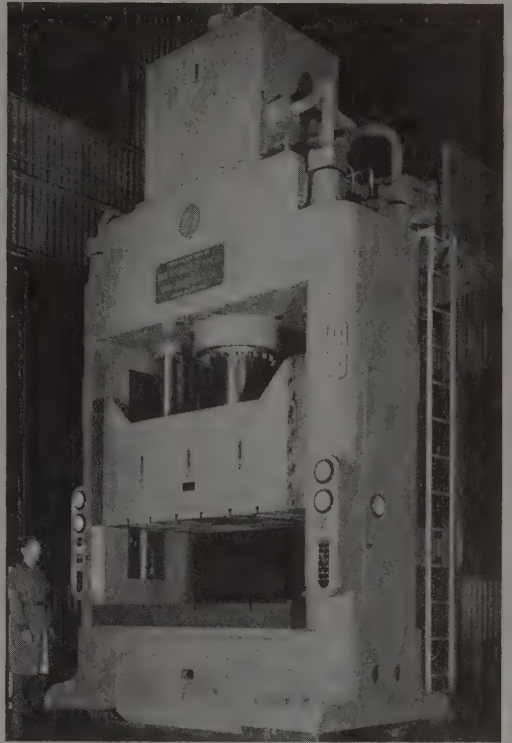
Equipment used in this process developed by Harper J. Ransburg Co. of Indianapolis, consists of a rectifier and a high voltage transformer, electrode system and controls. These components are, of course, additional to the items comprising a standard setup used in automatic spraying, i.e., spray booth, conveyor and spray guns. A 220 v, 60 cycle, single phase, alternating current is used to energize the voltage pack which delivers approximately 100,000 v with a current rating not exceeding 10 milliamperes. This voltage source is connected to the electrode system which creates the electrostatic field.

The electrode system, composed of a rigid framework supporting fine copper wires, is positioned so that the wires are opposite to and at a minimum distance of 12 in. from the surfaces being sprayed. A distance of about 18 in. is maintained between the complete electrode assembly and the nearest grounded part other than the object. Reason for the distance between electrode and sprayed surface being a critical factor in the efficiency of the unit's operation is that the force of the field is inversely proportional to the distance between these elements.

Other factors that have been determined and are closely controlled to assure maximum efficiency include the use of certain standard fluid tips and air caps, maintenance of correct fluid and air pressures, correlating these pressures with conveyor speed and film thickness requirements, etc. Certain types of standard fluid tips and air caps must be used so that the coating material can be broken up at air pressures below those used in high pressure spraying. Considerable care must be exercised in the selection of the fluid tips and atomizing cap to provide the requisite degree and uniformity of atomization of the finished material. Atomization that produces overfine particles leads to waste because many of the particles are carried away in the air stream; inadequate atomization produces coarse and nonuniform particles that produce a surface that is either splotchy or too wet.

Use of low-propellant pressures is necessary so that the work surfaces are covered as the result of the attraction of the dissimilar charges carried by the work

FAST ON THE DRAW: Oblong shapes are deep drawn at high speeds on this 500-ton Fast-traverse sheet metal drawing press built recently by Hydraulic Press Mfg. Co., Mt. Gilead, O. With platen 96 x 48 in. and bed 96 x 54, the press has a 42-in. stroke, with 48-in. maximum opening. Three independent die cushions are provided, each with 27 x 32 in. platens and 18-in. stroke. Machine also can be used for general purpose single-action work



and spray particles rather than by the mechanical force of the spray. Another important reason for not exceeding the lower air pressure ranges is to prevent the air stream from carrying away the finely atomized particles. It has been found that air pressures of approximately 15 to 20 psi and fluid pressures of 3 to 4 psi are quite generally the most efficient combination for electrostatic finishing.

Spray guns are positioned to form an acute angle with the conveyor and to face the oncoming material. In some installations the guns are oscillated to gain advantage of electrostatic and mechanical actions. The guns also may be oscillated to more evenly distribute the spray in the field and destroy the mechanical pattern or location of material produced by the guns.

Normal ventilation requirements are adequate for the electrostatic spray booths. In fact, best results are obtained in usual practice when the average booth exhaust velocity has been reduced slightly. Type of conveyor which will be used to move the parts depends to some extent on the size, shape and other characteristics of the parts to be handled. Such standard types as monorail, overhead, belt, etc., have all been used without requiring major changes. In some cases the objects are rotated at approximately 2 or 3 rotations per foot of lineal travel to give additional insurance that

the finish will be applied smoothly and evenly over the surfaces of objects that have protrusions and recesses. In the discussion of the Ransburg installation at the John C. Virden Co. that is to follow, the articles thus are rotated as they enter the spray zone.

The use of electrostatic spraying is not limited to the coverage of magnetic materials; articles made of such materials as copper, brass, aluminum can be sprayed without difficulty. Even non-conducting materials such as bakelite, rubber, porcelain and wood can be handled in this system although in such cases special arrangements are required to make the part that is sprayed a collecting electrode. Any finishing material that can be successfully atomized at lower pressures can be applied by this method. The only other requirement the finish must fulfill is that it be adjusted in solvent balance so that the finish will be sufficiently wet at the time of its deposition. Finishes which have been applied successfully with the electrostatic process include synthetic enamels, cellulose lacquers, wrinkle and splatter finishes, as well as some chlorinated-rubber type adhesives.

Another of the Ransburg electrostatic painting processes is electrostatic detearing. In detearing, electrostatically charged electrodes are used in this method to pull off the droplets of excess paint that collect at the drain off points of

dipped articles after complete drainage is effected. By passing the work pieces, which have been dipped and allowed to drain over a drain board in the usual manner, over an electrode bearing a charge opposite to that of the work and grounded conveyor the last tear or drip is pulled off to leave the article with a smooth and uniform coating.

Results obtained with the Ransburg spraying system at the John C. Virden Co., Cleveland manufacturer of standard light fixtures and holders, is a typical example of what can be accomplished with electrostatic spray finishing. Mr. R. W. McPherson, vice president, states that before the system was put into operation, the crew in the finishing department produced 300 units per hour. With the application of electrostatic spraying, production in this department has been more than tripled. This increase in production rate to 1000 units per hour has been realized without increasing the size of the crew.

Considerable quantities of various standard holders, known as staple items to the electrical trade, must be finished speedily to keep pace with the rest of the production line. The items are stamped from aluminum, copper, brass or steel. As the stampings come off the punch presses they are loaded into barrels and those that are to be electrostatically spray painted are carted to the loading end of an overhead conveyor

serving this booth. Here they are "racked" in groups of four to each holder, and the holders, called racks, are hung from hooks on the conveyor. The articles are then ready for the cleaning operation.

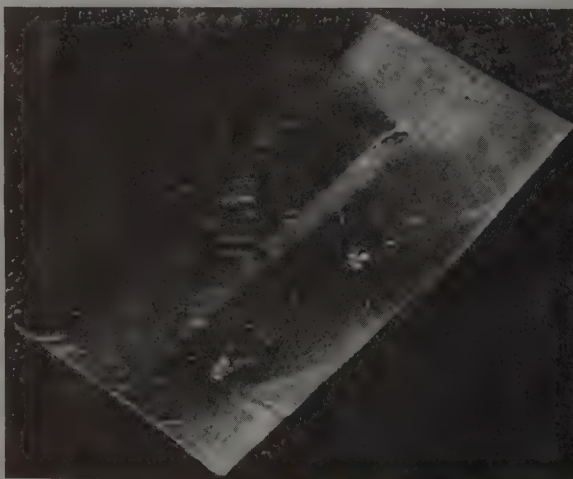
Because the light fixtures are used indoors in commercial and residential buildings where beauty of finish is paramount, the surfaces have to be absolutely clean to insure that the high bake enamel to be applied will produce an adherent, glass-smooth coating. Initial cleaning operation is to remove surface dirt and oil with steam under relatively high pressure. The fixtures then are given a cold water rinse, a hydrochloric acid dip, and a final water rinse. All parts that are of steel are given a copper flash plating prior to the spray painting. The copper flash plating is followed by a water rinse, a dip in a rust preventive solution and a final water rinse. Immediately after leaving the last rinse the wet articles are speedily dried in a gas oven.

The conveyor then carries the fixtures for a short distance thus allowing them to cool before they enter the spray booth. Fig. 3 shows the Ransburg electrostatic unit used at John C. Virden Co. Spray guns remain more or less in a fixed position inasmuch as the work does not vary too radically in size or shape. A somewhat higher than normal air pressure is used but, because the other factors of

the system have been adjusted in accordance with it, excellent results are obtained. Efficiency of the coat application is increased by slowly rotating the work as it moves through the spray zone. Obviously, mechanical rotation of the article is possible only when its external symmetry assures that all portions of the surface will bear a charge of uniform strength. As can be seen in Fig. 3 the guns are pointed almost parallel with the conveyor and are positioned slightly to one side of it.

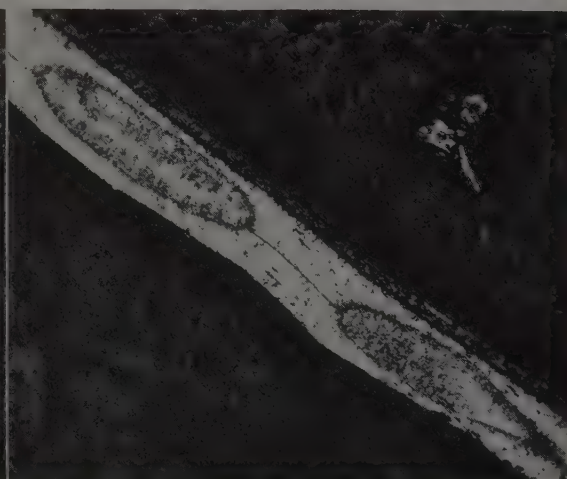
To prevent the freshly painted surfaces from picking up small particles of floating dust, the articles are conveyed only a very short distance before they enter the infra-red drying oven shown in Fig. 4. Height of the oven is sufficient to accommodate any material handled at the present time. Thereafter the conveyor makes a turn and the items are brought to the packaging department (see Fig. 5) where they are removed from the racks and placed on a belt type conveyor. Workers stationed along this conveyor inspect and either assemble and pack, or just pack the fixture and its components.

Equal savings can be made in coating large articles electrostatically. For example, Pennsylvania Range Boiler Co. was coating 10 to 15 water heater jackets of the type used in home automatic hot water systems per gallon of synthetic enamel. Three hand spraymen



SEAM WELDED STAINLESS: Macrograph (X4), left, shows seam welding of type 302 stainless steel, 0.0015-in. thick, as developed by Solar Aircraft Co., San Diego, Calif., for the fabrication of insulation blankets for a late type of turbo-jet engine. The sample was partially subjected to the peel test. Note that apex of tear is well-rounded and full width of nugget, indicating complete fusion and a full strength weld.

Micrograph (X150), right, is of a seam weld in this material made with identical procedure, except that welding speed is doubled in order to expose individual nuggets for inspection.



Diameter of the nugget shown is 0.011-in. along major axis and 0.0023-in. on the minor axis. Weld penetration is approximately 72 per cent.

Welding conditions are: Electrode force, 120 lb; time, one cycle on and one cycle off; current, approximately 4000 amp; electrodes, RWMA class 1, 8 in. diameter, 3/16-in. wide, with 1½-in. radius face; speed, for gas tight welds, 18 in. per min; spots per inch, 100; material preparation, clean. Light burnishing with No. 400 emery paper is recommended. Photos courtesy

Resistance Welder Manufacturers Association

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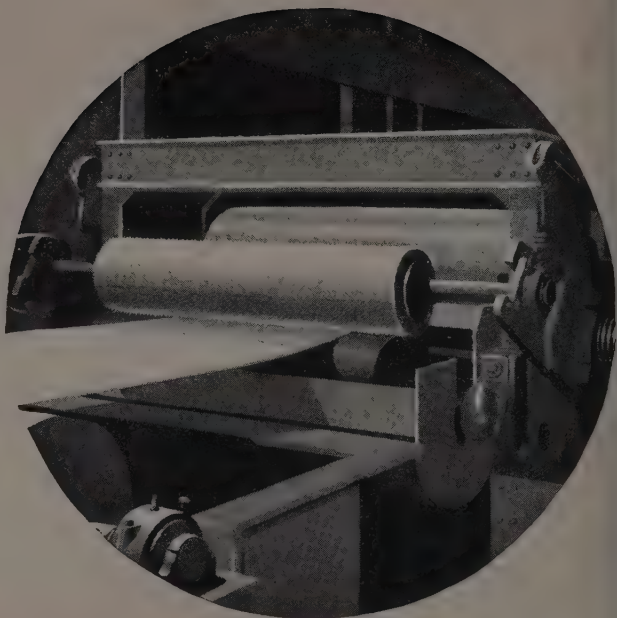
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As a leading manufacturer of paints, Pittsburgh found that a reliable source of quality brushes was necessary for the proper application of its products. For over 40 years, Pittsburgh has made its own paint brushes. It was a natural step to extend its engineering and manufacturing facilities by developing production, maintenance and power-driven brushes engineered to the specific needs of industry, since many types of power-driven brushes are employed in our own production processes.

Finish up with a

Pittsburgh Power-Driven Brush

● A Pittsburgh Brush does the job fast and gives you a uniformly finished product. You can depend on Pittsburgh Brushes for better performance, enduring economy, and a minimum of lost time in changeovers. In the complete Pittsburgh line are brushes of all types, including "Perfect Balance" sections, wheels and section assemblies, Uni-Fill scratch brushes, as well as paint and other maintenance brushes. ● Consult with the Pittsburgh engineering representative. He will gladly work with you in developing any type of power-driven brushes to meet your particular finishing requirements.

**PITTSBURGH
PLATE GLASS COMPANY**

Brush Division

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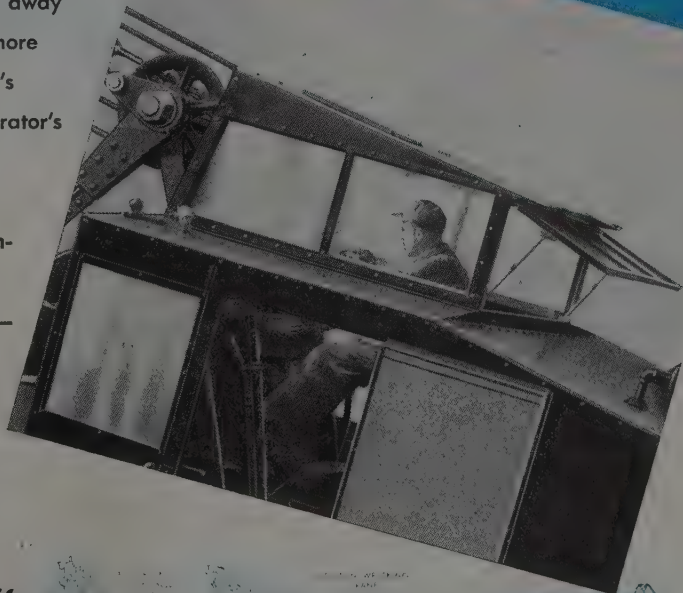
NO NEED TO STICK YOUR NECK OUT FROM---



the Cab of a Brownhoist Crane

A complete circle—that's the field of vision of the operator in the cab of a Brownhoist Diesel Locomotive Crane. No awkward peering around corners, no hazardous guesswork, no maneuvering to get away from "blind spots." That means faster, safer, more efficient material handling, especially since there's plenty of smooth, positive power right at the operator's finger-tips.

Rotating and travel friction disc clutches with one-point adjustment; roller bearings at all essential points; one-piece cast steel bed; 14" safety clearance between rotating bed and car body—these and other design and construction features assure you maximum operating ease and efficiency with a Brownhoist Diesel Locomotive Crane equipped with magnet, hook, or bucket. Write for complete particulars.



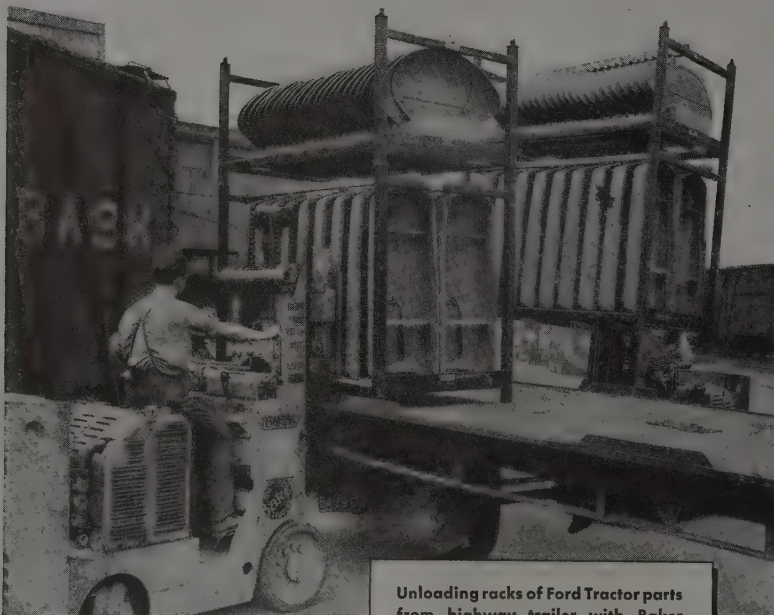
Brownhoist builds better cranes

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN

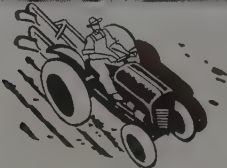
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BAKER TRUCKS

help lower Production Cost — *of Ford Tractors*



Unloading racks of Ford Tractor parts from highway trailer with Baker Fork Trucks. Trucks tier these racks in convenient storage areas and transport them to assembly lines.



The essential relation between "mass production" and "engineered material handling" is effectively demonstrated at Ford's huge Highland Park, Mich., tractor plant. Here modern mechanized handling facilities consisting of hoists, roller conveyors, sliding ways and a fleet of Fork Trucks, keep materials moving in a highly integrated, efficient flow pattern reducing handling costs to a minimum.

Wherever possible, parts and materials are handled on pallets. Incoming shipments not palletized by suppliers are usually palletized upon arrival — and the ultimate aim is to have all suppliers ship on pallets. Certain parts, such as tractor fenders, arrive nested on tierable racks (see illustration). Besides cutting costs by eliminating individual piece-by-piece handling, this "unit load" system permits tiering to conserve storage space.

Baker Material Handling Engineers are prepared to recommend similar cost saving methods for your plant.



Members:
Electric Industrial
Truck Association

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
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Baker INDUSTRIAL TRUCKS

were required for the job. By doing this finishing inside an electrostatic field (Fig. 6) they now spray more than 30 casings per gallon of enamel. In addition to these benefits, only a part time attendant is now needed, he merely needs to check and set the controls for the equipment.

National Production Co. has accomplished an 85 per cent cut in finishing labor and a 40 per cent savings in paint with the electrostatic equipment shown in Fig. 7. Production of the finishing line has increased from 20 to 50 units in the same amount of time. According to Mr. P. P. Barker, president, "Where one man operates the entire Ransburg setup, we used approximately seven men with the old method. Also, production runs steadily, we have no paint sags on our product; it is a much better job than previously done with manual operation."

Machine Tool Paint Color Standard Considered

Plans to formulate a draft specification for the preparation of basic colors for use on machine tools have been made by Committee on Paint Color for Machine Tools of the Canadian Standards Association. Name of selected color and assignment of a color number are included in the plans, as well as sample chips showing the selected color or colors.

Co-operating with the CSA are the Canadian Paint, Varnish and Lacquer Association, the Canadian Electrical Manufacturers Association and the Illuminating Engineering Society. At the present time the American Standards Association is considering a proposal for the initiation of a new project on the subject.

Pamphlet Covers Benzene Inhalation Hazards

Precautions to be observed in handling drums, bottles and tank trucks of benzene, a coal tar product with low boiling point and rapid evaporation characteristics giving off toxic, flammable vapors is the subject of a pamphlet issued by Division of Labor Standards of the U. S. Department of Labor. Grounding and bonding methods to prevent ignition by static electricity, specifications for explosion-proof equipment and safe operation of enclosed and partially enclosed systems are described in detail.

An accompanying chart points out fire hazards, storage requirements, fire fighting phases and cautions for transporting and handling benzene (not to be confused with benzine, a less toxic petroleum product). Protection of personnel liable to exposure, and symptoms of acute and chronic poisoning and first aid measures are also included in the publication.

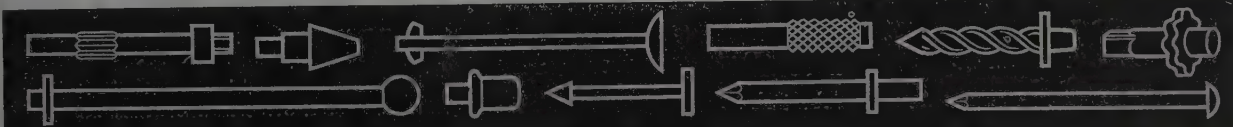
Cold-Headed Specialties



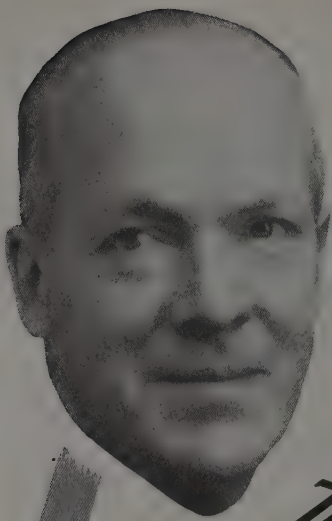
HASSALL cold-heading may solve your immediate special part problem... Special nails, rivets and threaded parts made in diameters from $1/32"$ to $3/8"$ —lengths up to 6"... Rivets $3/32"$ diameter and smaller a specialty... Variety of metals, finishes and secondary operations... Economy, quality and quick delivery in large or small quantities... Tell us what you need... We will answer promptly. **ASK FOR FREE CATALOG.** 3-color Decimal Equivalents Wall Chart free on request.



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MANUFACTURERS OF COLD-HEADED SPECIALTIES — ESTABLISHED 1850



**"we proved
our ability
to be of
service ..."**

says W. H. Kuelster
**STUART OIL COMPANY
REPRESENTATIVE**

Stuart Oil Performance Report on

ThredKut 61

Type of product manufactured by company
covered in this report:

Machined parts from rough forgings
Personnel interviewed:
Machine Shop Supt. and General Foreman

Stuart Oil Products used in this plant:
ThredKut 61, Solvol

Specific operations covered by this report:
Drilling and boring forged "5060" steel pump liners

Performance details:
"Problem was presented here in boring 7 1/2" dia. holes through 11" dia. x 30 1/2" solid forged pump liners running about 170 Br. Liners are run on two heavy duty lathes, one starting with a 1" dia. drill followed with a boring bar; the other a heavy boring bar used for removing entire 7 1/2" of stock."

"Solvol was performing well on 4615 steel, but when 5060 steel was substituted, they could barely get 1 to 1 1/2 liners per day, from one lathe. Switching to ThredKut, tool life improved, but still only got one liner per tool grind, plus terrific vibration. Our inspection of tools indicated dilution was in order. A 6-1 blend of ThredKut and Pffe. was decided upon...and it licked the job...they now turn out 3 1/2 liners per day per lathe, meeting production schedules...and are very appreciative of our help in solving this problem."

W. H. Kuelster

HERE is another case where Stuart engineering service played an important part in solving a tough cutting problem. No "panacea" for all metal-working ills, Stuart Oil products must be used correctly to meet specific requirements. In this instance, the right oil was being used, but without necessary dilution. Our background and experience in helping to solve scores of similar problems is available to assist you in analyzing cutting fluid requirements. Write for further information.

Illustrated is one section of the completely equipped Stuart Metallurgical Laboratory, where the "Straight Line to Metal-Working Efficiency" begins.

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STUART service goes with every barrel



Flame Hardened Steel

(Concluded from Page 109)

In Table III the physical properties are shown in two different heats. In Figs. 1, 2 and 3 are shown the microstructures in as cast condition, transition, zone and case near the surface, respectively. Table II shows hardness against drawing temperatures.

By lowering the allotropic transformation point it is possible to harden to required depth. In Table I is shown the comparison of hardness between water quenched surface and air quenched. The test was made on samples from the same heat. The torch speed in case of air hardening was 7 ipm.

It should be mentioned that the depth of hardness and even distribution are important. If the case is too deep, or not even, cracks can easily result, due to expansion, contraction and structural stresses set up during the hardening operation. Depth of the martensitic layer is determined by service desired, and can be controlled accordingly.

Application of this steel as cast to the tool and die field seems to be most logical. The steel welds easily and actually is a low-alloy type. In the annealed condition, hardness is around 230-240 brinell and the casting obviously can be machined easily and spotted in the press in the soft condition; then the torch is passed over those sections where hardness and resistance to wear are important, thus saving many hours of labor. If any alteration is necessary, softening is readily possible by reheating the spot below 1500° F, and flame hardening again. The air hardened bar fracture in Fig. 4 shows how hardness diminishes progressively with depth. The hardness gradient insures against both spalling and sinking of the hardened surface when subjected to the repeated impact and high-pressure loading encountered in cold working die applications.

Application of this type of steel in the as-cast form is increasing rapidly. Uses include blanking and body dies, and trimming dies and punches, crane wheels, gear teeth, sprockets, and punches and grips for hot-flanging operations.

Importance of selecting the proper iron for better wear or corrosion service was emphasized by F. G. Seifing, metallurgist, development and research division, International Nickel Co. Inc., New York, in his talk before the Birmingham District Chapter of American Foundrymen's Association recently. He said nickel alloy gray irons are most suitable for resistance to the wear occurring in engine parts.

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The modern enclosed construction of these presses saves valuable floor space—especially in rows or batteries—keeps working parts free of dust and dirt.

Keep your productive equipment geared to the modern trend of the products you manufacture.

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This 300-ton 4-point press is typical of the Danly line of one, two and four point models which range in size from 100 tons up—special sizes and adaptations built to customer specifications.

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Amazing speed—ease of operation!—
Will drive standard machine screws,
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with standard round, flat, binder, fillis-
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**ALL SCREWS DRIVEN
TO UNIFORM TENSION**

**NO MARRING OF
HEADS**

Cuts show simple fix-
ture for driving
screws on an arc,
with all screws
driven to the same
depth. Note sim-
plicity of fixture for
moving assembly
from screw hole to
screw hole.

Complete assem-
bly of 22 screws
driven in 45 sec-
onds.

DETROIT POWER SCREWDRIVER CO.

2811 W. Fort Street
DETROIT 16, MICH.

Waste Pickle Liquor

(Continued from Page 121)

be excluded in the manufacture of photo-
graphic film and fine optical instruments,
it was stated.

Purifying hydrocarbons for testing pur-
poses by a new procedure stands to
greatly accelerate chemical research on
petroleum compounds, Dr. Alfred Hirsch-
ler and Senta Amon of Sun Oil Co., Nor-
wood, Pa., reported to the petroleum
division of the American Chemical So-
ciety. The new procedure depends upon
the ability of activated carbon silica gel
and other materials to adsorb virtually
all impurities present in petroleum hy-
drocarbon compounds, yielding products
of such high purity that they can be
used to set the standards for spectro-
scopic analysis and other exacting mea-
surements of physical and chemical prop-
erties.

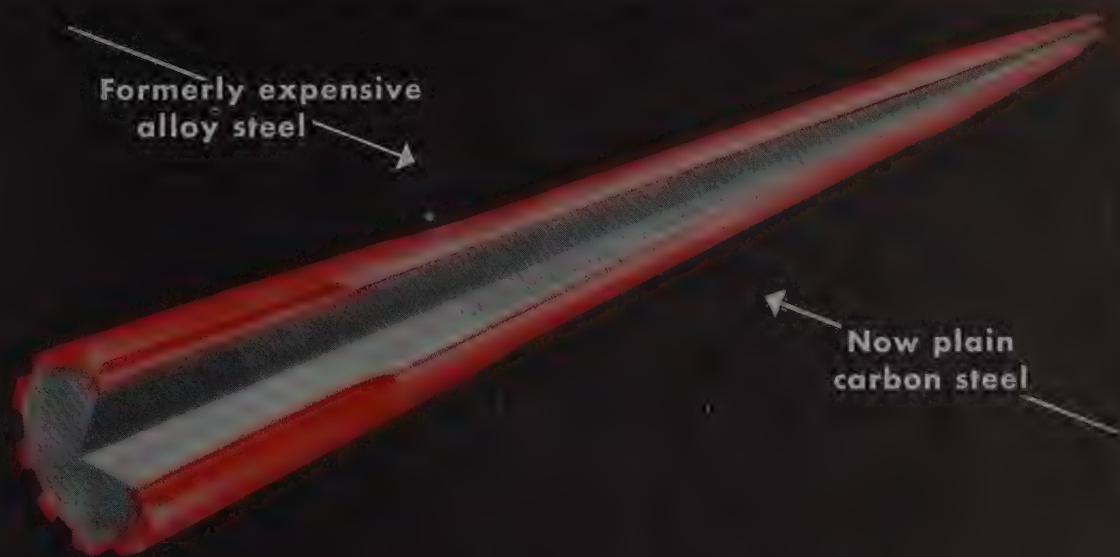
New procedure consists of filling a
cylindrical tube with a granulated ad-
sorbent solid and allowing the hydro-
carbon to filter slowly through the col-
umn. Said to be inexpensive and simple,
the apparatus requires only 2 to 4 hours
for purification as contrasted with sev-
eral weeks often needed by fractional
distillation.

Silicone Finishes Resist Heat

According to the presentation of James
R. Patterson, General Electric Co., Sche-
nectady, N. Y., before the industrial
and engineering chemistry division, re-
cently developed paints, varnishes and
enamels made from silicone, the principal
element in sand, have shown unusual
resistance to heat, weather and chemical
corrosion. He stated that under ordi-
nary conditions the finishes will not
crack, fade, stain or lose their gloss.

Future uses of silicone finishes will be
on various metal products and appliances,
automobiles, machinery, signs, etc. Be-
cause of the relatively high cost and
limited production, at the present time
they are being applied to furnaces, boil-
ers, hot exhaust stacks and chemiplant
equipment where their resistant prop-
erties are essential.

Ranging from hard and brittle glass-
like materials to heavy oils, the newly
developed silicone materials are color-
less or nearly so, are easily dissolved
in organic solvents and blend readily
with many of the common pigments.
According to Dr. Patterson, the out-
standing properties of these finishes might
be their excellent resistance to heat,
weather and various chemicals. They
will withstand temperatures of 1000° F
for a few hours and 500° F for several
hundred hours, he stated. Based on
present knowledge, the most heat re-
sistant silicone finishes are those pig-



Formerly expensive
alloy steel

Now plain
carbon steel

SAVES \$125 PER DAY with TOCCO Induction Hardening

An automotive manufacturer reports these benefits from the surface-hardening of axles with TOCCO:

Cuts cost 17%. Permits use of SAE 1035 plain carbon steel where former method required more expensive SAE 4140 alloy steel. One man operates a completely automatic 6-station fixture powered by two 125 KW TOCCO Machines. Total savings amount to about \$125 per day.

Increases axle strength 200%. Tests show a minimum of 200% increase in torsional fatigue life, compared to former method. TOCCO's automatic control assures uniform surface hardening of every axle to 55 R.C.

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★ "HARD-DUR" Gears preserve the tooth form. They are made only of the finest gear steels and are scientifically heat treated to obtain the maximum physical properties. They are so much stronger, harder and more wear-resistant than similar untreated gears that they are guaranteed to have four to five times the life and at only 50 per cent extra in cost.

"HARD-DUR" Gears handle the tough jobs on which ordinary gears fail and when used on the average job they last almost indefinitely.

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THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

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mented with the conventional amount of aluminum powder.

Stabilizing of lead by sodium treatment, a development of Okonite-Callender Cable Co. Inc., Paterson, N. J., has shown that failures caused by defective sheaths in paper-insulated cables have been effectively eliminated. This fact was brought out in the paper presented by B. B. Reinitz and N. A. Zamborsky of that company before the division of industrial and engineering chemistry of the society.

Ten years experience with this method proved its effectiveness. The treatment serves to eliminate dissolved gases, oxides and sulphides generally present in commercial lead. The process consists of introducing a sodium-lead alloy into molten lead, the undesirable impurities rising to the surface where they are skimmed off.

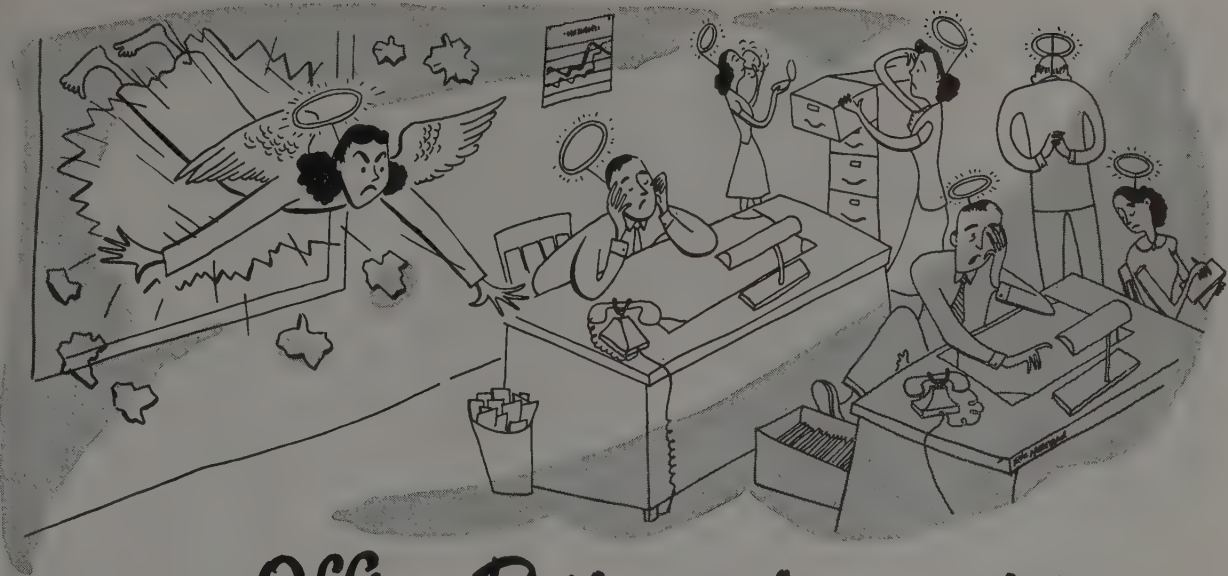
Chemicals from Natural Gas

Early production of vast quantities of synthetic gasoline, industrial alcohol and many other chemicals from natural gas was forecast by Dr. Robert S. Aries, research associate of the Polytechnic Institute of Brooklyn, before the division of sugar chemistry and technology. "Grain" alcohol made from natural gas and petroleum is destined to predominate in industry, he stated, with molasses, the preferred raw material for industrial alcohol before the war, occupying only a minor position. This alcohol may be made from natural gas either directly or as a by-product in the production of synthetic gasoline, he continued, the use of such production methods serving to almost double our vanishing petroleum reserves.

"In addition to by-product alcohol and other chemicals, tremendous tonnages could be made directly from natural gas with fuel oil as a by-product. The process may be varied at will, changing the yields of some chemicals at the expense of others," Aries reported. He went on to say that the know-how of natural gas conversion has already been acquired and commercial production is expected to start before 1950.

Discovery of a process whereby triptane, one of the most powerful aviation fuels known, may be practically made is now an achievement of the petroleum industry, stated Dr. Vladimir Haensel and Dr. V. N. Ipatieff of Universal Oil Products Co., Chicago, before the society's division of petroleum chemistry. Although discovered in 1943, commercialization of the process must await development of aviation engines which require better fuel than now in use, their paper stated.

The starting material for the production of triptane is made from refinery gases by processes called polymerization



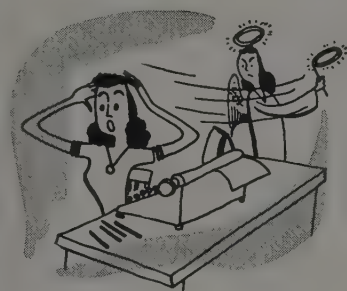
Office Patience is no virtue

It was as if an atom bomb, instead of an angel, had entered the room.

"I've come to take back your halos," the mad angel said. "I've just learned that

Office Patience is no virtue!

"Satan—or some other black sheep—has had the wool over our eyes for too long a time."



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and hydrogenation. This mixture is converted to triptane by a catalytic process called selective demethylation, a relatively simple process which consists of treating the mixture with hydrogen and a catalyst, preferable nickel or cobalt, at a temperature of about 500° F under a pressure of 100 to 500 psi.

Fine particles of limestone (calcium carbonate), each measuring less than 0.00001-in. in diameter, serve to increase the hiding power of paints and conserve scarce pigments, according to a paper presented by Dr. L. H. Cohan and Dr. H. W. Siesholtz of Witco Chemical Co., New York, before the division of colloid chemistry.

These particles, obtained from precipitation from chemical solution, offer a comparatively large surface to reflect light. It was pointed out that this tendency to reflect light increases the hiding power and lessens the amount of pigments required. It has also been found that finer particles also tend to thicken paints and increase the tinting power of pigments.

A new and highly sensitive apparatus for measuring the heat required to vaporize liquids may facilitate the search for better petroleum fuels, according to a paper by Dr. Defoe C. Ginnings and the late Dr. Nathan S. Osborne of the National Bureau of Standards, Washington, D. C., presented before the division of physical and inorganic chemistry.

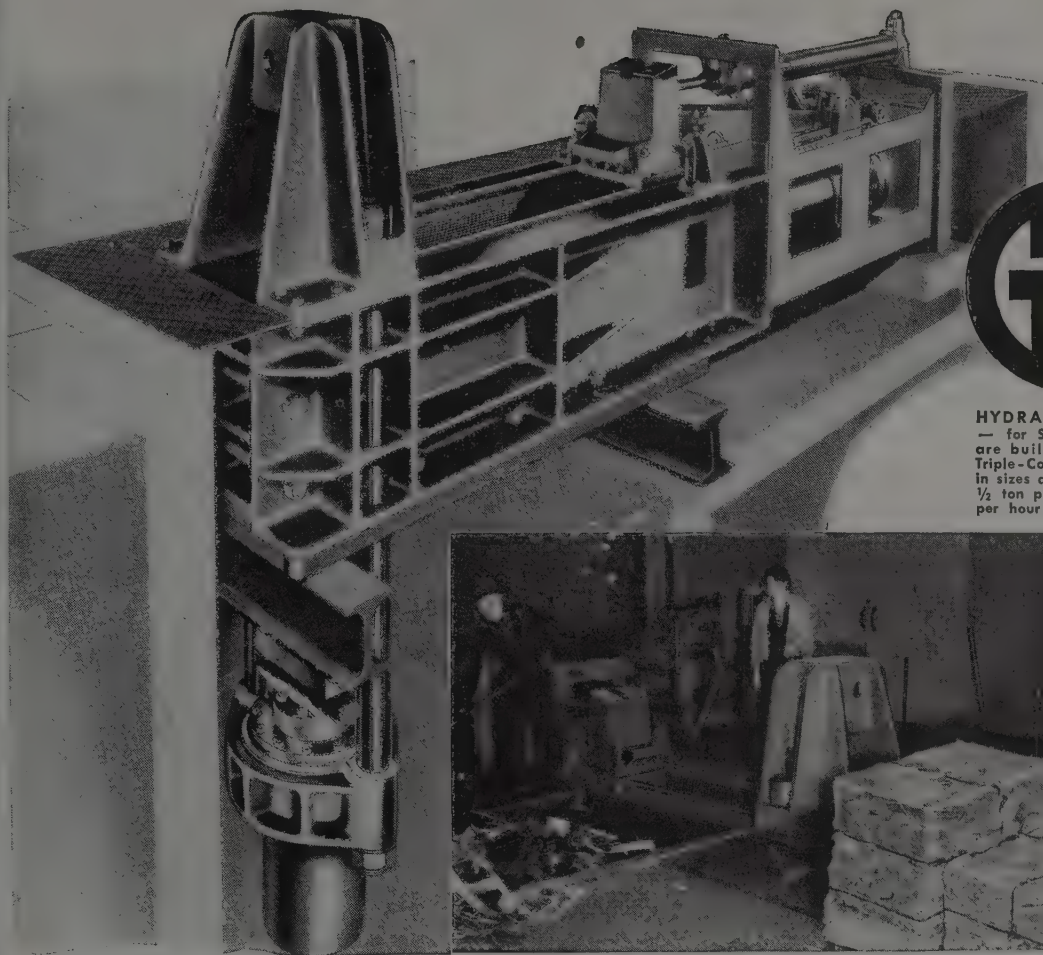
It was explained that one of the important physical properties of fuels of the gasoline type is the heat of vaporization. The new apparatus is capable of an accuracy of about 0.02 to 0.03 of 1 per cent under ideal conditions, the paper said. Since some of the pure hydrocarbons are available only in relatively small amounts, the apparatus is designed to test samples of about 1/5 pint.

New Lubricant Developed For Deep Drawing

Hydrogenated castor oil—a development of Budd Co., Philadelphia—was found to give excellent results on extremely severe drawing operations, according to Paul G. Nelson, metallurgist of the automobile body division of that company, quoted in *Metals Review*, March, 1947.

This lubricant, although much more expensive, has reduced die maintenance and stamping breakage sufficiently to more than justify its increased cost, he stated. Used for deep drawing of some stainless steel parts, the new lubricant reportedly was found to possess more satisfactory qualities than filled lubricants, which are satisfactory for mild drawing and forming operations.

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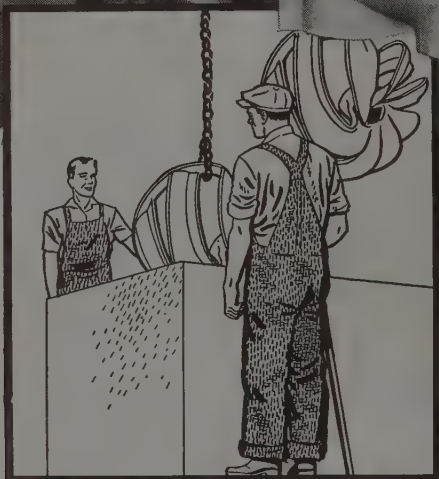
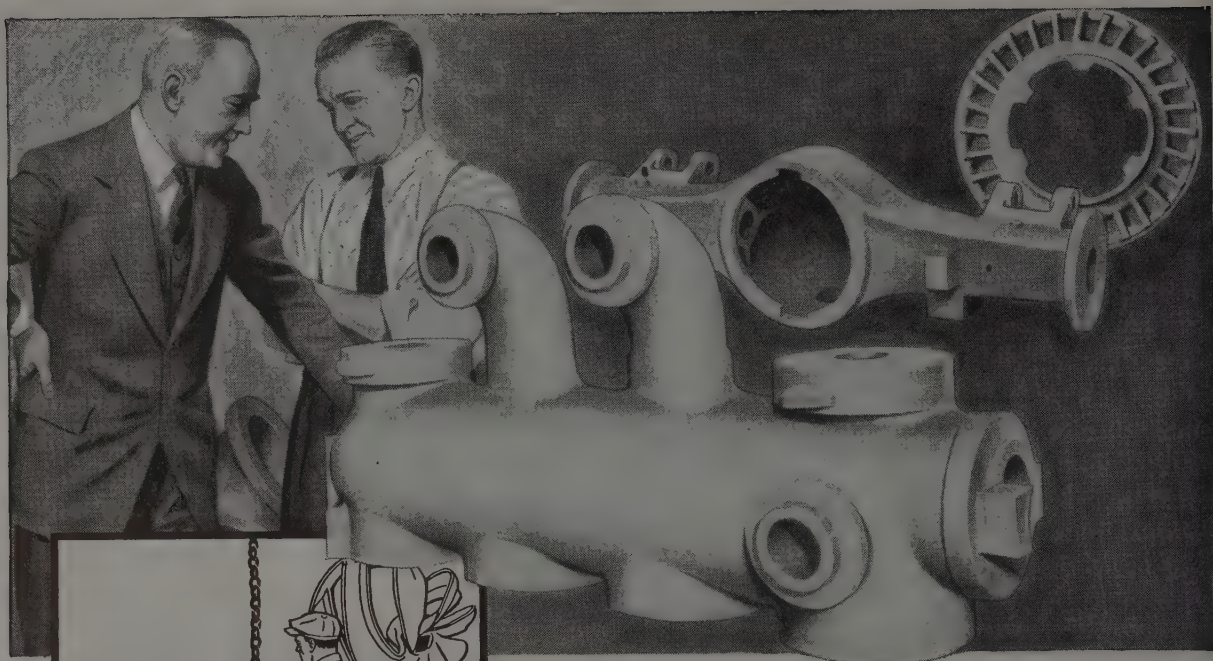
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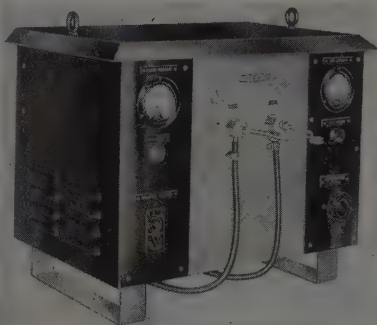


Pennsylvania

New Products and Equipment

1. Induction Heater

Measuring only 22 in. wide, 20 in. high and 16 in. deep, a new 2 kw bench model induction heating unit is the smallest ever made by Scientific Electric Division of "S" Corrugated Quenched Gap Co., Garfield, N. J. It



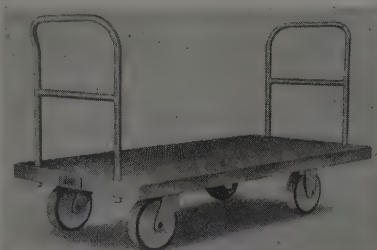
operates from a 110 v line and is equipped with foot switch and one work coil made to customers' requirements. Coil may be from 1/2 to 2 1/2-in. in diameter. Unit operates with a coil of one turn to a maximum of 20 turns.

2. Drawing Compound

Nonpigmented Beacon No. 103 drawing compound, developed by J. W. Kelley Co., Cleveland, is readily removed from any work piece to be enameled or bonderized, regardless of time elapsed between die work and finishing. Applied by brush or dip, it may be cut to proper consistency with water. The compound contains no mineral oils and is removed with mild alkali cleaner, emulsified solvent or degreaser.

3. All-Aluminum Trailer

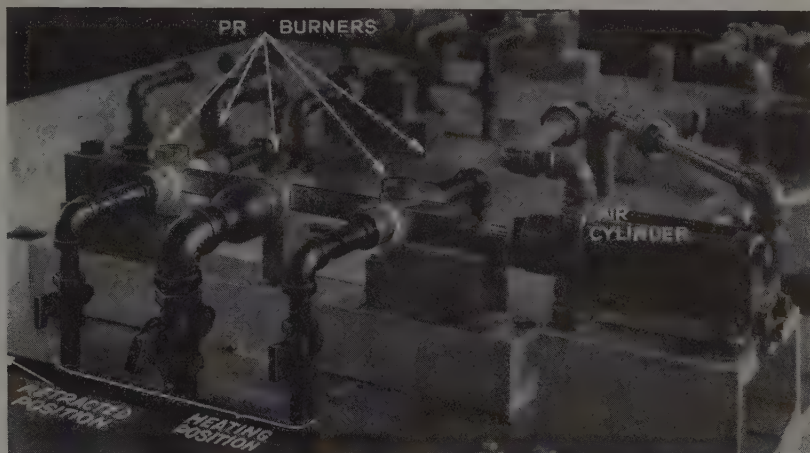
With a nominal capacity rating of 2000 lb, a new all aluminum trailer or hand truck, made by Mercury Mfg. Co., 4140 South Halsted street, Chicago 9, weighs but 175 lb. It has a load platform 3 x 6



ft and 14 1/2-in. high. Size may be varied to suit special requirements.

Frame is constructed from aluminum alloy structural shapes, while deck is

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 158



nonskid aluminum plate of 3/16-in. thickness. Deck and frame are of welded assembly. Solid rubber tire type wheels are bearing mounted. Platform has aluminum alloy tube stake pockets on both sides and ends.

4. Brazing Machine

Stronger, more uniform joints are obtained through automatic control of heat pattern and heat time, fuel supply and assembly by above brazing machine developed by Selas Corp. of America, Philadelphia 34. Designed for brass fixtures, it completes the brazing operation within 30 sec. Three stations are provided for operation in a loading, heating and cooling sequence.

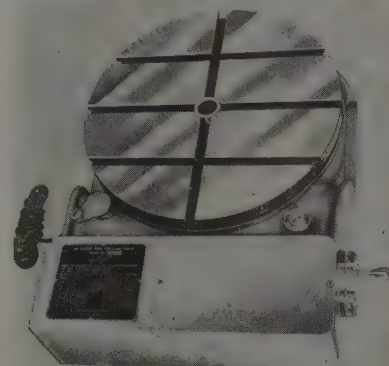
Fixture's five component parts with alloy rings preplaced are fluxed and positioned in a supporting jig. Air pressure is applied to assure close contact of all parts during heating and cooling cycles. As burners are brought into brazing position a solenoid valve opens the gas-air mixture line. A timer releases burners at end of the heating cycle and cuts fuel supply to maintain a pilot.

5. Rotary Table

An electrically driven, single unit rotary table virtually eliminates setup time when adapted to any milling machine, shaper or horizontal boring mill for power rotary milling or precision indexing work. Announced by W. B. Knight Machinery Co., St. Louis, the 24 3/4 x 30 x 7 1/4-in. table provides 18 feed changes from 1 1/2 to 54 ipm. An op-

tional range of 3 to 108 ipm is also available.

Features include a simplified system of changing feed gears, graduations in



minutes as well as degrees, T slots machined from the solid and antifriction bearings. Reversible electric motors of 1/4-hp for any specified voltage are supplied.

6. Hole Locator

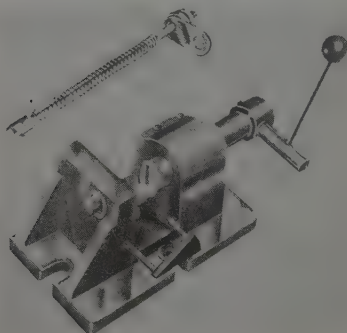
An instrument with which holes can be located and drilled on an ordinary drill press with great accuracy is announced by DoAll Co., Des Plaines, Ill. Locator consists of two arms of hardened and ground tool steel at right angles to each other within 30 sec of arc. At exact vertex of the right angle is a ground tapered hole in which drill bushings are held by a bridge clamp.

A vernier stop slides on each of the arms which are graduated for 6 in.

Arrangement of two vernier stop slides at right angles makes tool easy to use. It may be used for center punching and as a drilling and reaming jig. Locating pieces on lathe face plates and on angle plates and checking of dies, jigs and fixtures are among its other uses.

7. Milling Fixture

Intended primarily as a production milling fixture, a new tool offered by Manufacturers Engineering Ser-Vice Inc., 415 Security Bank building, Toledo, O.



also can be used as a work holder for tapping, drilling, reaming, deburring, spot facing, grinding and bench assembly. Called the Kam-Grip, it can be automatically operated by drill press action when used for drilling and tapping.

Fixture includes lock and release rod, two sets of anvils and movable jaws to accommodate round, hexagon and square stock from 1/8 to 1 1/8-in. diameter. All wearing parts are constructed of heat treated machine steel.

8. Key Filing System

A key filing system, the Ke-Master, made by Cushman & Denison Mfg. Co., 133 West 23rd street, New York 11, consists of slotted fiber tags, attached to the keys, which hang on spiral wire racks, which in turn are mounted either on wall racks, boards or in cabinets. Swaying will not dislodge the keys which are clearly visible and easily accessible.

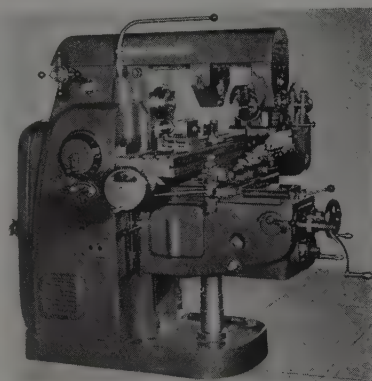
9. Knee-and-Column Miller

No. 2 ML is the designation given the new line of knee-and-column type milling machines built by Cincinnati Milling & Grinding Machines Inc., Cincinnati 9. Offered in plain and universal styles, each machine has speed ratios of 60 to 1, feed ratios of 120 to 1 and 16 spindle speeds ranging from 25 to 1500 rpm, enabling it to perform many operations encountered in the metal working industries.

Spindle runs on three bearings —

tapered roller at front and center and ball at the rear. The 3 hp motor is mounted on a cradle support which is removable. Lubrication of the machine is automatic. Feed controls are independent of each other, and each has a forward, neutral and reverse position.

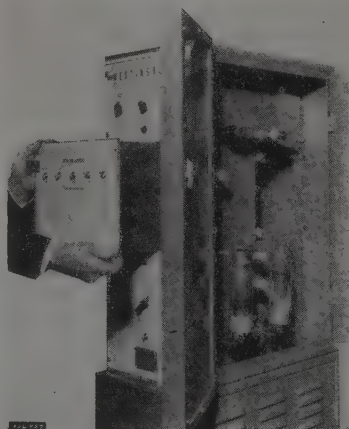
"Live" rapid traverse, at the rate of 150 ipm longitudinal and cross, and 75



ipm vertical, may be engaged through a lever control at the side of the knee. The overarm is a rectangular shaped casting fitted with dovetail ways at the top of the column. It incorporates a built-in vibration damper. The coolant system features complete enclosure of a centrifugal pump, drive shaft and greater portion of coolant supply piping.

10. Welding Controls

Hundreds of combinations for sequencing and timing from only four factory wired subassemblies and two supplementary subassemblies are possible with the line of nonsynchronous packaged alternating current resistance welding



controls offered by Westinghouse Electric Corp., Buffalo. Known as Weld-O-Timer, controls are made in two frame sizes and they may be side mounted to the welder, floor mounted next to the welder or mounted at any convenient

place away from the welders with controls at the welder.

Finger tip control speeds production as job can be quickly set. Voltage regulator tubes in timing circuits give more accurate timing when connected to welder supply circuits. Inspection of subassemblies is simplified in both models through a front access door.

11. Lapping Machine

Both rough and fine or finished lapping operations may be performed on the dual roll centerless lapping machine produced by Size Control Co., 2500 Washington boulevard, Chicago 12. Roll



on left accomplishes rough lapping, while roll on right does the finished lapping, a finish of less than 2 micro-inches being easily obtainable. One piece or a hundred can be lapped with no necessity for making setups.

12. Rust Remover

Clear, non-oily Y-3 rust remover, applicable by sponging, dipping or brushing, removes rust or stain from ferrous or nonferrous metals in 3 to 15 min, according to Yosemite Chemical Co., 1040 Mariposa street, San Francisco 10. At end of this period, rust may generally be wiped off with a damp cloth, abrasives not being necessary except in case of deep pitting. Remover leaves a clear, invisible film or a darker, more porous film (depending on time allowed to stand) which makes a good paint bond.

13. Tubular Micrometer

Weight is cut and measuring accuracy increased through use of tubular structure in the Tumico micrometers manufactured by Tubular Micrometer Co., St. James, Minn. It allows greater freedom of movement with lighter "touch" and "feel."

Features include a wear take up spindle bushings assembly which compensates for wear at the frame; three points of take up for micrometer thread wear—spindle, tip and on thread; anvil

and spindle hardened to rockwell 64-C; and graduations and numerals large and easy to read. Frame parts are plated with copper, nickel and chromium. Distortion or spread is imperceptible.

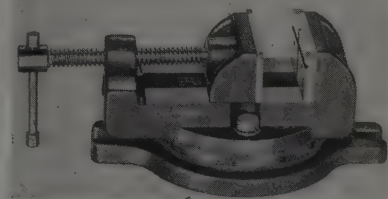
Micrometers are furnished in a variety of types. Included are conventional type ranging in size from 0 to 24 in., blade



type for measuring narrow depths ranging from 0 to 4 1/2-in. and roller mill type with 3 or 6 in. throat depth. Other types are bow micrometers with interchangeable mandrels, sizes from 0 to 96 in., inside micrometers ranging from 6 to 106 in. and over-the-bar type for internal bore measurements, ranging from 8 to 28 in.

14. Milling Machine Vise

Equipped with a swivel base to afford quick, accurate set-ups at any radius within 360 degrees, Palmgren milling machine vise, manufactured by Chicago Tool & Engineering Co., 8387 South



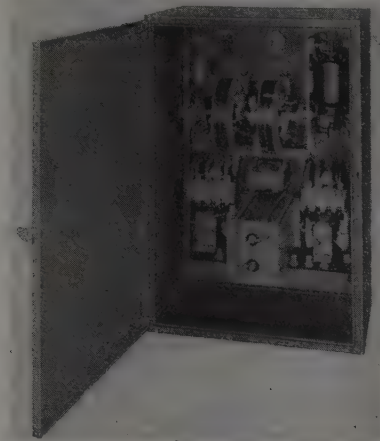
Chicago avenue, Chicago 17, will resist tool pressure and vibration. Constructed low, its jaws are of steel, one being grooved horizontally and vertically for holding round pieces. Base is graduated into full 360 degrees and once set, it locks in position. Four-inch jaws of 4 5/8-in. high vise open to 4 in.

15. Welder Timer

Fully automatic control for gun welder applications to obtain the maximum speed and performance from the tool and associated air system, is announced by Industrial Controller Division of Square D Co., 4041 North Richards street, Milwaukee 12. Identified as class 9052, type

FG, timer consists of synchronous motor driven cam shaft, two control relays, low voltage transformer and capacitor braking circuit consisting of large condenser, reactor and resistor.

Timers provide a fifth timing period called a "squeeze delay" which makes the squeeze times for the first and suc-



ceeding welds independently adjustable, resulting in a saving in time on repeat welding jobs. Motor is geared directly to the cam shaft. Capacitor braking circuit stops the motor quickly and accurately.

16. AC Electrodes

New shielded-arc coating for five grades of aluminum bronze electrodes produced by Ampco Metal Inc., 1745 South 38th street, Milwaukee 4, enables the Ampco-Trode AC electrodes to strike easily without "snuffing out." Spatter loss is reduced to a minimum and manipulative charac-

FOR MORE INFORMATION

on products and equipment described in this section; fill in a card following page 158.

teristics are improved for welding with reverse polarity, direct current. Company recommends rods for welding cast irons, malleable irons, aluminum bronzes, silicon bronzes, some nickel alloys and dissimilar metals with ac transformers.

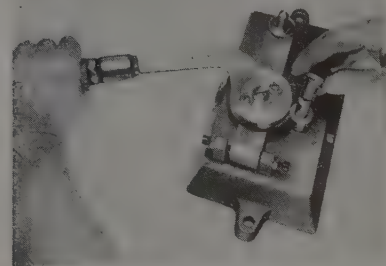
17. Arc Welding Compound

Developed to produce cleaner, better welds, POM electrically conductive arc welding compound is a composition of inorganic minerals which supplement the fluxing action of welding rod coatings. Made by G. W. Smith & Sons, 5400 Kemp road, Dayton 3, it stabilizes and quiets the welding arc, prevents arc breakage;

improves fusion and prevents scale on both sides of weld bead. It also prevents adhesion of weld spatter to parts being welded.

18. Marking Machine

Bushings, screw machine parts and lathe product parts may be marked with numbers, lettering or trademarks using the No. 921 marking machine developed by Acromark Co., 398 Morrell street, Elizabeth, N. J. Variations of sizes and thicknesses of parts is provided by an adjustable arm incorporated on the ma-

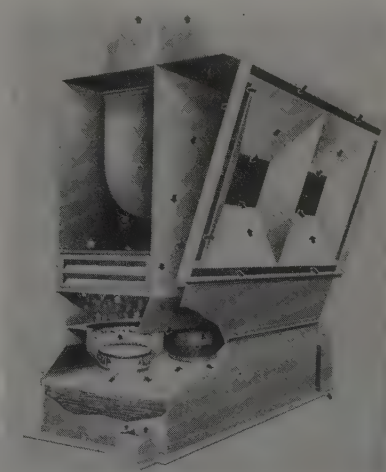


chine. The part holding mandrel is set in a heavy boss with or without roller bearing construction.

Holder itself is of ring segment type that is locked with two screws and permits loosening of type and interchanging. Base of machine is a solid casting with ears for attaching to work bench.

19. Shake-Out Booth

Designed for use individually or in combination — to collect dust from shake-out, core knock-out, shaker screening, etc.—the Uni-Wash shake-out booth,



offered by Newcomb-Detroit Co., 5741 Russell street, Detroit 11, is a self-contained unit. It includes an intake hood, air cleaning process and exhaust fan. Made in five sizes, the unit has sufficient

intake suction to carry away much of the fumes of such operations.

Air is drawn into booth, given a multiple wash and then passed through moisture separators. Dirt from air is collected in form of wet sludge in the water tank. An automatic sludge conveyor carries the sludge to the discharge point.

20. Linear Speed Meter

Providing an accuracy of 1 per cent, type 25B linear speed meters for measuring speed of travel are manufactured by Metron Instrument Co., 432 Lincoln street, Denver 9. Usually supplied as single range instruments, they are available in a wide selection of ranges from 3 to 3000 yards per minute or 10 to 10,000 fpm. All are direct reading.

Contact to the moving member is made with a replaceable free running disk 1 ft in circumference which is solidly clamped on the rotating shaft of the head. Contact surface is of oil resistant synthetic rubber. Lubrication of the head is permanent.

21. Recoiling Trouble Light

A 25-ft independent recoiling trouble light is being produced by Koiled Kord Division of Kellogg Switchboard & Supply Co., 6650 South Cicero avenue, Chicago. Called the Recoilo-Lite, it is jacketed in neoprene and therefore impervious to steam, water, oil, grease and most acids. It is adjustable to any length by means of a safety clamp, extending from a 43-in. retracted length to 25 ft. It is also available in 25-ft lengths.

22. Margin Justifier

Adaptable to any typewriter, the Edison margin justifier makes that device capable of perfectly aligning right margins, at the same time evenly spacing words and letters. Distributed by the Justifier Sales Co., 2022 Glendale boulevard, Los Angeles 26, device makes it possible to extend or condense the standard typewriter line, still eliminating the ragged right margin.

23. Semi-Elliptical Plates

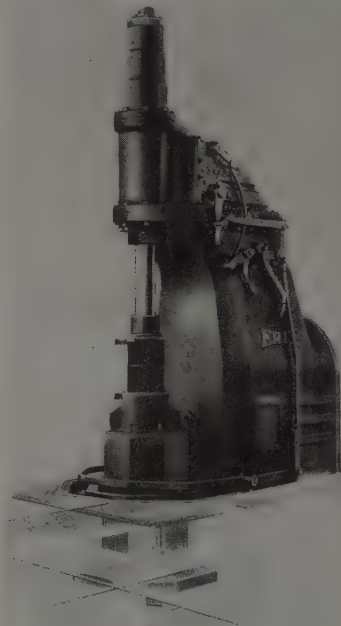
Misalignment of punch press equipment may be corrected with Di-Ali-Ners, consisting of a pair of semi-elliptical plates, one concave and the other convex and both with flat exterior surfaces, made by Lempco Products Inc., 5711 Dunham road, Bedford, O. Each plate contains a hole large enough to clear any die set shank.

Installed with their curved surfaces

facing each other, these machined malleable iron, cadmium plated aligners correct bad errors, regardless of whether the fault lies between press bolster and die holder or between the press ram and punch holder or front or back. Made in sizes from 6 x 6 in. to 16 x 16 in., they are used as follows: Convex plate is placed on top of concave plate, either over or under die set, with a cushion of light oil between the plates. Weight or pressure is exerted on press, squeezing out oil and correcting misalignment by ball action of plates. With pressure still exerted, the job is locked up.

24. Pneumatic Hammer

Flat die forging work without need for separate steam or air supply is possible with the pneumatic hammers built in sizes ranging from 200 to 3000 lb drop pressure by Erie Foundry Co.,



Erie, Pa. Piston is located at middle of the piston rod and is forged integral with it. Top end of the rod runs in a guide formed in the top cylinder head so that the striking mass is held in alignment by top guide, and the guide formed in the gland at the bottom end of the cylinder.

Overall length of ram and piston assembly is almost four times rated stroke of the hammer. Hammer includes an unloading valve so that motor can be started without developing pressure in the compressor. When motor and flywheel are up to speed, this valve can be returned to its operating position. Ram then lifts to top of its stroke and hammer

is ready for operation. Blows per minute vary with the moving weight from 200 to 85 and motor horse power from 10 to 150. Strokes vary from 14 to 38 in.

25. Soldering Tool

Lightweight, compact, portable electric soldering tool with thumb switch for close heat control, developed by Ideal Industries Inc., 1921 Park avenue, Sycamore, Ill., can be used for long periods without overheating. Complete unit includes a transformer or power unit and a soldering tool that operates like a pair of pliers. No preheating is necessary. Unit, known as Thermo-Grip, is rated at 1000 w.

26. Soldering Flux

Thorough dissolving of metal oxides, thus preparing a surface for the solder to alloy itself with the metal, is claimed for the Flux-Stik, a soldering flux in convenient stick form. Nonacid, it can be used for overhead, inaccessible and out-of-the-way soldering locations where cleaning of the metal is difficult, according to Lake Chemical Co., Chicago.

The flux is nonrunning—when heat is applied, it will cover the immediate vicinity of the soldering joint only, it is said. It can be applied equally well either to hot or cold metal, permitting the solder to flow easily and smoothly. The company states that it can be used for sweat joints of copper or brass tubing, manifolds, traps, elbows, piping, sheetmetal.

27. Temperature Gage

An electronic instrument applicable in processes which demand accurate control of temperature ranging from 100° below zero to 1000° above, is a development of Brown Instrument Co., division of Minneapolis-Honeywell Regulator Co., Philadelphia 44.

Known as the Electr-O-Vane, the control unit operates on the principle that when a metal van is interposed between two oscillator coils, the state of oscillation can be made to change or stop in an electronic circuit. This change or stopping oscillation causes the electronic circuit to operate a load relay. Coils are molded in bakelite and are moisture proof.

FOR MORE INFORMATION
on the new products and equipment
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It will receive prompt attention.

Helpful Literature

50. Welding Electrodes

Champion Rivet Co.—Two pamphlets describe Champion high speed tool steel and Champion C-30 electrodes. Tool steel electrodes can be used for building up composite turning tools and planer, shaper and lathe cutting tools by welding cutting edge on carbon steel base. C-30 rod is suitable for building up wearing parts where long wearing machineable welds are necessary.

51. Hand Cranes

Downs Crane & Hoist Co.—28-page illustrated bulletin No. 1000A presenting data on line of hand cranes describes safety factors, construction features, capacity ratings, unit and replacement parts. Engineering drawings and specifications are included.

52. Plastic Folding Machines

Taber Instrument Corp.—6-page illustrated bulletin No. 4701-5M describes Thermocreater plastics folding machine which is thermostatically controlled, hand fed and foot operated for performing right-angle bends in sheet plastic from 0.005 to 0.02-inch thick. General operating data are included.

53. Forgings

Jos. Dyson & Sons Inc.—6-page illustrated brochure entitled "There is No Substitute for Quality" describes hydraulically pressed and flat die forgings, offers suggestions on proper applications of each and relates their advantages. Custom and production services are outlined.

54. Secondary Transformers

Westinghouse Electric Corp.—16-page illustrated booklet No. B-3777 diagrams radial, network and conventional secondary banking systems as well as new banked secondary method for obtaining protection with CSPB self-protected transformers.

55. Electric Connecting Plugs

Cannon Electric Development Co.—76-page illustrated wire-bound book is entitled "Cannon Plugs, the 'Quick Disconnect' for the Electric Circuits of Industry." Book is digest of ideas for assembly, servicing, maintenance and portability of electric equipment using connectors. Wide range of industrial applications is covered.

56. Precision Lathes

South Bend Lathe Works—8-page illustrated catalog No. 25 briefly describes South Bend precision lathes of the following sizes: 13, 14½ and 16-inch quick change gear types; 10-inch swing lathe; 13, 14½ and 16-inch toolroom lathes; 9-inch bench type lathes; 9-inch underneath motor drive and 10-inch swing over bed type.

57. Insurance Terminology

Employers Mutual Liability Insurance Co. of Wisconsin—60-page pocket-size booklet "A Dictionary of Insurance Terms" is presented to make insurance terminology understandable. Definitions used are intended to clarify commonly used terms in casualty and fire insurance.

58. Tube Connector Fittings

Everhot Products Co.—4-page illustrated folder Index No. 630 describes two-piece Everseal self-flaring fittings for use in connecting tubes. For application tube is inserted through nut and placed in correct position. Nut is then tightened down, sleeve is sheared off and tube flared in recess of female fitting. Type and sizes are listed.

59. Rotary Gear Pump

John S. Barnes Corp.—9-page illustrated loose-leaf bulletin describes Constant-flo rotary gear pump with exclusive Barnes gear tooth structure. Features, applications, advantages of use, specifications and dimensional drawings of various sizes are given.

60. Cutting Fluids & Coolants

D. A. Stuart Oil Co.—36-page illustrated vest-pocket size booklet No. 5 is digest of four technical papers presented to the American Society of Tool Engineers on cutting fluids and coolants. Topics covered include cutting feeds and speeds, testing of fluids and the proper selection of cutting fluids.

61. Oil Refinery Equipment

International Nickel Co.—8-page illustrated bulletin "Handling Caustics without Corrosion Problems" reveals information on plant corrosion tests on equipment used to remove mercaptans from petroleum products. Comparative test data on Monel, 70/30 copper-nickel, mild steel and other materials used for handling caustic solutions are included.

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62. Openside Planers

G. A. Gray Co. — 18-page illustrated bulletin No. 55 is devoted to 24, 30 and 36-inch Cub planers. Diagrams and photographs are used to describe table ways, column and knee design, table speed control, dial feed, rail setter, safety clutches, lubrication, space saver drive, and many other features.

63. Contract Facilities

Atlas Metal Stamping Co.—32-page illustrated brochure entitled "A Load off Your Shoulders onto Ours" presents details of company's design, engineering and production facilities for fabrication of tools and dies, jigs and fixtures and special machinery to order.

64. Automatic Internal Grinder

Bryant Chucking Grinder Co.—4-page illustrated bulletin form No. 109 presents information on series 109 fully automatic precision grinder for small bores. Total chuck swing is 9 inches, maximum traverse stroke is 6 inches and maximum grinding length is 4 inches.

65. Branch Pipe Outlets

Bonney Forge & Tool Works—32-page illustrated pocket-size "Handbook of Branch Pipe Outlets" describes methods of installing WeldOlets in wide variety of applications. Step-by-step procedure is outlined.

66. Laboratory Furnaces

Boder Scientific Co. — 2-page illustrated bulletin No. B-4702 describes three styles of electric high temperature laboratory furnaces. Construction, manual and automatic control, electrical equipment and specifications are covered.

67. Tools, Dies & Machines

Bunell Machine & Tool Co.—32-page illustrated bulletin No. 471 describes company's design, engineering and production facilities for producing tools, dies, jigs, gages, fixtures and special machines and equipment on order. Shop views and list of equipment are included.

68. Electrode Specifications

Arcos Corp.—13-page illustrated booklet contains tentative specifications for corrosion resisting chromium and chromium-nickel steel welding electrodes as recently prepared jointly by American Welding Society and American Society for Testing Materials.

69. Heat Treating Fixtures

Driver-Harris Co. — 24-page illustrated bulletin No. F-46 describes large number of fixtures designed for specific heat treating purposes in pit-type furnaces. Bulletin is intended to serve as guide to solution of special problems of fixture design.

70. Soluble Cutting Oil

Gulf Oil Corp.—6-page illustrated vest-pocket size folder No. SP 2888 deals with soluble cutting oil which will serve as lubricating and cooling fluid. Material is stable, nonfoaming, helps prevent rust and has pleasant odor. Recommended dilutions are included.

71. Locomotives

Whitcomb Locomotive Co.—File folder contains 12 data sheets illustrating and describing line of diesel-mechanical and diesel-electric locomotives for industrial and railway haulage. Features are described and specifications are given.

72. Industrial Trucks

Hyster Co.—16-page illustrated catalog No. 1057B presents information on model No. 75 Hyster industrial truck for use in handling lumber, pipe, drums, crates, cartons of all sizes, etc. Unit will hoist and transport heavy loads of all types. Dimensions, lifting heights, loads and turning radius specifications are included in descriptive material.

73. Automatic Lathes

Jones & Lamson Machine Co.—4-page illustrated folder No. 469 describes 12 and 16-inch Fay automatic lathes which can be equipped with standard or special tooling for short run jobs or long production runs. Illustrations show lathes in use for turning automobile counter gears. Diagrams, production data and specifications are included.

74. Industrial Strainers

Elliott Co.—4-page illustrated folder No. A-12 describes type K self-cleaning strainers which are recommended for service where large amount of dirt or foreign matter is to be removed from water. Geared motor turns rotating element which blanks off straining element sections one at a time, allowing back flowing water to flush out dirt.

75. Consulting Service

Associated Engineers Inc.—16-page illustrated brochure outlines this organization's services for industry. Included are business administration, industrial engineering, mechanical engineering, architectural and structural engineering, research, and time and motion studies. Facilities and personnel are described.

STEEL—Penton Building, Cleveland 13, Ohio

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Steel Users Seen Adopting More Cautious Buying Policy

Heavy mill order backlogs assure high steelmaking operations indefinitely into future despite hint of easing pressure for shipments. Supply still out of balance with demand. Scrap market continues to sag

METALWORKING operations continue impeded by shortages of steel, especially flat-rolled products. Currently a number of plants, including automotive, report inventories too small to support full production schedules, and they have been forced to temporarily curtail operations. Nevertheless, while consumers are seeking more tonnage than mills can supply promptly, evidence is accumulating to indicate a more conservative buying policy is in ascendency.

For one thing, users are less inclined to accept substitute specifications, and, further, reluctance to accumulate inventories is growing. From some consuming points reports are heard that suppliers are being asked by manufacturers not to make shipments ahead of schedule. Still another straw in the wind pointing to easing consumer pressure is waning interest in black market steel offerings. To what extent this rising conservatism is due to talk of a possible business recession later in the year and how much to better inventory balance is uncertain. Operations are contracting in a few consumer goods lines where output is catching up with demand, at least at present price levels. Also, building activity is disappointing for this time of year, being held back by high labor and material costs.

Heavy mill order backlogs assure high steelmaking operations indefinitely into the future. Steel producers are turning down tonnage although selling quotas for third quarter are a little more liberal. Given a few months of high operations, however, and the situation may ease no-

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended May 10	Change	Same Week 1946	Same Week 1945
Pittsburgh	100.5	- 0.5	45	92
Chicago	78.5	- 8.5	53	98
Eastern Pa.	91.5	+ 0.5	57	93
Youngstown	91	None	45	92
Wheeling	81.5	- 7.5	74.5	91.5
Cleveland	97	+ 4	78	93.5
Buffalo	88.5	None	49	90.5
Birmingham	99	None	44	95
New England	95	None	80	90
Cincinnati	87	None	89	87
St. Louis	68.5	None	54.5	80
Detroit	90	- 2	84	88
Estimated national rate	92	- 2	55.5	95

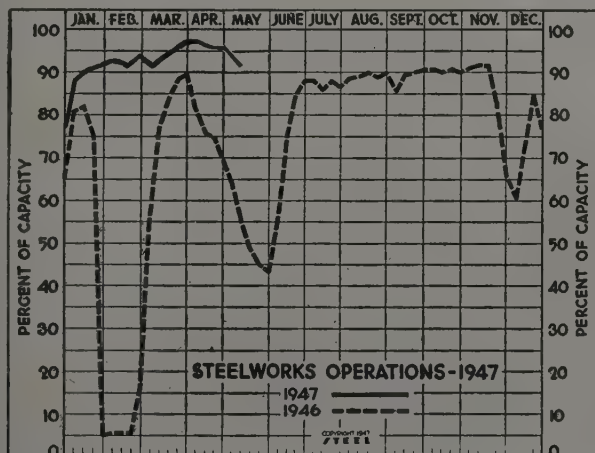
Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

ticeably in some leading products though any slack in domestic demand is likely to be promptly taken up by foreign requirements.

Higher steelmaking costs preclude any early reduction in finished steel prices despite the satisfactory first quarter earnings of the steel industry. Compilation by STEEL shows 20 producers, representing 86 per cent of national ingot capacity, had net profit of \$115,277,513 in the period compared with \$89,023,008 in the fourth quarter, 1946. Recent wage increases, however, will boost direct steel labor costs at least \$153 million over the remainder of this year while raw material charges are expected to continue upward. In view of this no material easing in prices seems likely pending return of a more competitive market with supply and demand in better balance than at present. At the moment, scrap continues soft with prices down from a week ago in several important consuming areas. At Pittsburgh the market appears settling around \$30 for heavy melting grade, but with relatively little buying a test of strength is lacking.

Scattered furnace shutdowns due to labor difficulties and repairs resulted in a drop of 2 points in the national steel ingot operating rate last week to 92 per cent of capacity. This extends to 18 weeks the period during which operations have held above 90 per cent. Operations were down 8½ points at Chicago last week to 78.5 per cent, reflecting a strike at plants of the Inland Steel Co. The rate was off 7½ points at Wheeling to 81.5 per cent, and was also down 2 points in Detroit to 90 per cent. However, an increase of 4 points was reported at Cleveland to 97 per cent, and a rise of ½ point pushed the eastern Pennsylvania rate to 91.5 per cent. Elsewhere operations held steady.

Further decline in scrap prices in the Chicago and eastern Pennsylvania districts resulted in a further drop of \$1.33 per ton in STEEL's composite price average on steel-making scrap to \$29.25. Composite price averages held at \$69.82 on finished steel, \$52.10 on semifinished steel, and \$32.49 on steelmaking pig iron.



COMPOSITE MARKET AVERAGES

	May 10	May 3	Apr. 26	One Month Ago Apr., 1947	Three Months Ago Feb., 1947	One Year Ago May, 1946	Five Years Ago May, 1942
Finished Steel	\$69.82	\$69.82	\$69.82	\$69.82	\$69.82	\$63.54	\$56.73
Semifinished Steel	52.10	52.10	52.10	52.10	52.10	40.60	36.00
Steelmaking Pig Iron	32.49	32.49	32.49	32.49	29.59	25.50	23.00
Steelmaking Scrap	29.25	30.58	31.33	33.94	37.25	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe.
 Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—
 Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland Neville Island, Granite City and Youngstown. Steelworks Scrap
 Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago
 Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	May 10, 1947	Apr., 1947	Feb., 1947	May, 1946
Steel bars, Pittsburgh	2.60c	2.60c	2.60c	2.50c
Steel bars, Philadelphia	2.98	2.98	2.98	2.82
Steel bars, Chicago	2.60	2.60	2.60	2.50
Shapes, Pittsburgh	2.50	2.50	2.50	2.35
Shapes, Philadelphia	2.64	2.64	2.64	2.465
Shapes, Chicago	2.50	2.50	2.50	2.35
Plates, Pittsburgh	2.65	2.65	2.65	2.50
Plates, Philadelphia	2.85	2.85	2.85	2.55
Plates, Chicago	2.65	2.65	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.55	3.55	3.55	3.405
Sheets, hot-rolled, Gary	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Gary	3.55	3.55	3.55	3.405
Hot-rolled strip, Pittsburgh	2.50	2.50	2.50	2.35
Cold-rolled strip, Pittsburgh	3.20	3.20	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.425	3.425	3.425	3.05
Wire nails, Pittsburgh	4.125	4.125	4.125	3.25
Tin plate, per base box, Pittsburgh	\$5.75	\$5.75	\$5.75	*\$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

	May 10, 1947	Apr., 1947	Feb., 1947	May, 1946
Sheet bars, Pittsburgh, Chicago	\$50.00	\$50.00	\$50.00	\$38.00
Slabs, Pittsburgh, Chicago	42.00	42.00	42.00	39.00
Revolving billets, Pittsburgh	42.00	42.00	42.00	39.00
Wire rods $\frac{3}{8}$ to $\frac{1}{2}$ -inch, Pitts.	2.55c	2.55c	2.55c	2.30c

† Base, No. 5 to $\frac{3}{8}$ -in.

Pig Iron

	May 10, 1947	Apr., 1947	Feb., 1947	May, 1946
Bessemer, del. Pittsburgh	\$34.83	\$34.83	\$31.83	\$27.69
Basic, Valley	33.00	33.00	30.00	26.00
Basic, eastern del. Philadelphia	35.52	35.52	32.01	27.84
No. 2 fdry., del. Pgh. N. & S. sides	34.33	34.33	31.33	27.19
No. 2 fdry., del. Philadelphia	36.02	36.02	32.51	28.34
No. 2 foundry, Chicago	33.00	33.00	30.50	26.90
Southern No. 2 Birmingham	29.88	29.88	26.88	26.94
Southern No. 2, del. Cincinnati	34.75	34.15	31.75	28.34
Malleable, Valley	33.50	33.50	30.50	26.50
Malleable, Chicago	33.50	33.50	30.50	26.90
Charcoal, low phos., fob Lyles, Tenn.	40.50	40.50	37.50	33.00
Gray forge, del. McKees Rocks, Pa.	33.66	33.66	30.66	26.55
Ferromanganese, fob cars, Pittsburgh	140.25	140.25	140.19	140.00

Scrap

	May 10, 1947	Apr., 1947	Feb., 1947	May, 1946
Heavy melting steel, No. 1, Pittsburgh	\$30.00	\$35.80	\$33.75	\$20.00
Heavy melt. steel, No. 2, E. Pa.	29.50	33.50	32.25	18.75
Heavy melt. steel, Chicago	28.25	32.75	31.25	18.75
Rails for reolling, Chicago	33.50	38.25	38.50	22.25
No. 1 cast, Chicago	35.50	42.50	42.50	20.00

Coke

	May 10, 1947	Apr., 1947	Feb., 1947	May, 1946
Connellsville, furnace ovens	\$9.125	\$9.06	\$8.875	\$8.15
Connellsville, foundry ovens	10.375	10.375	9.875	8.90
Chicago, by-product fdry., del.	16.10	16.10	16.10	13.75

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Reolling quality, standard analysis, price negotiated, fob mill. Forging quality, \$40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Canton, \$52.

Reolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$42; Portsmouth Steel Corp., \$55-\$60, Portsmouth, O. Detroit, del., \$45; eastern Mich., \$46.

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$50; Detroit, del., \$53; eastern Mich., \$54.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$61; del. Detroit \$64; eastern Mich., \$65.
 Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$50; Portsmouth Steel Corp., \$66, Portsmouth, O.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.35c per lb.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, $\frac{3}{8}$ to $\frac{1}{2}$ -in., inclusive \$2.55-\$2.90 per 100 lb. Galveston base, \$2.65. Worcester, add \$0.10. San Francisco (base, del.), \$3.27.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.60c; Detroit, del., 2.75c; eastern Mich., 2.80c; New York, del., 3.1c; Phila., del., 2.98c; San Francisco (base, del.), 3.33-\$3.65c; Los Angeles (base, del.), 3.325-\$3.56c; Seattle, 3.255c, base.

Rail Steel Bars: Price, 2.60c-2.95c, same basing

points as merchant carbon bars, except base is 10 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.05c; Detroit, del., 3.20c; eastern Mich., 3.25c (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.20c; Detroit, 3.35c; Toledo, 3.40c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 3.80c; Detroit, del., 3.95c; eastern Mich., 4.00c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.45c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.60c-2.95c.

Iron Bars: Single refined, Pittsburgh, 6.15c-16.70c; double refined, 7.00c-18.50c; Pittsburgh, staybolt, 7.85c-11.00c.

† Hand puddled.

Sheets

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c; Philadelphia, del., 2.70c; New York, del., 2.79c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co., quotes Middletown, O., base for shipment to Detroit; Alan Wood Steel Co., Conshohocken, Pa., quotes

3.10c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.35c; eastern Mich., del., 3.40c; New York, del., 3.61c; Philadelphia, del., 3.58c.

Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base, 3.55c; New York, del., 3.84c; Philadelphia, del., 3.75c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

Corrugated Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, base, 3.55c.

Culvert Sheets, No. 16, corrugated: Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.), 4.945c.

Aluminized Sheets: No. 20 hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

Long Terns, No. 10: Pittsburgh, Chicago, Gary, base, 3.55c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.20c; Kokomo, Ind., 4.30c. Armature: Pittsburgh, Chicago, Gary, 4.50c; Granite City, Ill., Kokomo, Ind., 4.60c. Electrical: Pittsburgh, Chicago, Gary, 5.00c; Granite City, Kokomo, 5.10c. Motor: Pittsburgh, Chicago, Gary, 5.75c; Granite City, 5.85c. Dynamo: Pittsburgh, 6.45; Granite City, 6.55c. Transformer 72, 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.15c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c. (Superior Steel Corp., 3.30c, Pittsburgh.)
Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del. 3.35c; eastern Mich., 3.40c; Worcester, base, 3.40c. (Superior Steel Corp., 4.70c, Pittsburgh.)
Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.20c; over 0.40 to 0.60 carbon, 4.70c; over 0.60 to 0.80, 5.30c; over 0.80 to 1.00, 6.80c; over 1.00, 9.10c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, \$5.75; Granite City, Birmingham, Sparrows Point, \$5.85.
Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, \$4.85; 0.50 lb tin, \$5.05; 0.75 lb tin, \$5.25; Granite City, Birmingham, Sparrows Point, \$4.95, \$5.15, \$5.35, respectively.
Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.
Manufacturing Terns (Special Coated): Pittsburgh, Chicago, Gary, 100-base box \$4.90; Granite City, Birmingham, Sparrows Point, \$5.00.
Roofing Terns: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb \$13.50; 15-16 \$15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.65c; Coatesville, Claymont, Geneva, Utah, 2.80c; New York, del. 2.94c; Phila., del. 2.85c; St. Louis, del. 2.47c; Boston, del. 2.86c; San Francisco and Los Angeles, del. 3.29c-3.46c.
 (Central Iron & Steel Co., Harrisburg, Pa., 3.85c, basing points; Alan Wood Steel Co., Conshohocken, Pa., 2.80c, Coatesville and Claymont equivalent.)
Floor Plates: Pittsburgh, Chicago, 3.90c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.787c; Coatesville, 4.15c.
Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; Inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.50c; New York, del., 2.70c; Phila., del., 2.64c; Geneva, Utah (base, del.), 2.675c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del. 3.14c; Kaiser, del., San Francisco, 3.41c. (Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)
Steel Piling: Pittsburgh, Chicago, Buffalo, \$3 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).
Wire to Manufacturers in carloads
 Bright, basic or bessemer\$3.30-\$3.55
 Spring (except Birmingham) **\$4.25
Wire Products to Trade
Nails and Staples
 Standard and cement-coated.....†\$3.75-\$4.50
 Galvanized\$3.75-\$4.50
Wire, Merchant Quality
 Annealed (6 to 8 base) \$3.95
 Galvanized (6 to 8 base) \$4.40
 (Fob Pittsburgh, Chicago, Birmingham, per base column)
Woven fence, 15 gage and heavier ††84
Barbed wire, 80-rod spool ††94
Barless wire, twisted 94
Fence posts (no clamps) ††90
Bale ties, single loop ††86

* Worcester, \$3.40, Duluth, \$3.35, base. San Francisco (base, del.) \$4.31 for bright basic only.
 ** Worcester \$4.35, Duluth and Trenton, N. J., \$4.50, base. San Francisco (base, del.) \$5.63 for MB spring wire; \$5.28 black premier.
 † Worcester \$4.05, Cleveland \$3.85, base. San Francisco (base, del.) \$4.83.
 ‡ Duluth \$3.75, Cleveland \$3.85, base. San Francisco (base, del.) \$4.83.
 § Worcester \$4.05, annealed; \$4.50, galvanized. Duluth \$3.95, annealed; \$4.40, galvanized base. San Francisco (base, del.) \$4.96, annealed; \$5.41, galvanized.
 †† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 84; barbed wire, 94; fence posts, 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, \$2.50 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, \$2.85 per 100 lb; light rails (rail steel), \$2.95, Williamsport, Pa.
 Relaying, 60 lb and over, fob railroad and basing point, \$46-\$49 per net ton.
Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates, \$2.80 per 100 lb; fob mill; \$3.15 base, Seattle. Splice bars, \$3 per 100 lb. S'andard spikes, 3.65c-4.50c; screw spikes, 5.30-6.40c.

Tubular Goods

Standard Pipe: Base price in carlots, threaded and coupled, to consumers about \$200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld					
In.	Steel		In.	Iron	
	Blk.	Gal.		Blk.	Gal.
¾	48	23	1½	—	2
1	51	30½	2	—	11½
1¼	55½	41	1-1¼	—	17
¾	58½	45	1½	—	22½
1-3	60½	47½	2	—	23
Lap Weld					
In.	Steel		In.	Iron	
	Blk.	Gal.		Blk.	Gal.
2	53	39½	1¼	—	1
2½-3	56	42½	1½	—	7
3½-6	58	44½	2	—	14½
*8	58	42½	2½-3½	—	17
*10	57½	42	4	—	21
*12	56½	41	4½-8	—	19
			9-12	—	10

* Not T. & C.

Seamless Steel					
In.	Blk.	Gal.	In.	Blk.	Gal.
2	52	38½	*8	57	42
2½-3	55	41½	*10	56½	42
3½-6	57	43½	*12	55½	41

* Not T. & C.

Line Pipe: Base price in carlots to consumers about \$200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Seamless	In.	Butt Weld
2	51	¾	47
2½ & 3	54	¾ & 1	50
3½ to 8	56	1½	54½
10	55½	1	57½
12	54½	1 to 3	59½

Roller Tubes: Net base prices per 100 feet, fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

		Seamless		Elec. Weld	
O.D.	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1" ... 13			\$10.89	\$10.62	\$10.62
1¼" ... 13			12.90	10.59	12.58
1½" ... 13	\$12.00		14.26	11.70	13.90
1¾" ... 13	13.65	16.23	13.31	15.82	
2" ... 13	15.29	18.17	15.00	17.95	
2¼" ... 13	17.05	20.26	16.71	20.00	
2½" ... 12	18.78	22.31	18.38	22.00	
2¾" ... 12	20.57	24.43	20.11	24.07	
3" ... 12	21.80	25.89	21.27	25.46	
3½" ... 12	22.87	27.18	22.26	26.68	
3¾" ... 11	26.88	31.94	26.15	31.33	
3½" ... 11	28.86	34.30	28.06	33.64	
4" ... 10	35.82	42.55	34.78	41.68	
4½" ... 9	47.48	56.42			
5" ... 9	54.96	65.30			
6" ... 7	84.38	100.25			

Pipe, Cast Iron: Class B, 6-in. and over \$65 per net ton, Birmingham; \$70, Burlington, N. J.; \$75.56, del., Chicago; 4-in. pipe, \$5 higher, Class A pipe, \$3 a ton over class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts		
¾-in. and smaller; up to 6 in. in length	55 off	
¾ and 1, up to 6 in. in length	52 off	
¾ x 6 in.	49 off	
¾ and 1 in. x 6 in. length	51 off	
1½ in. and larger in all lengths and ¾ in. and larger in lengths over 6 in.	48 off	
1½ in. and smaller, longer than 6 in.	45 off	
Tie bolts	38½ off	
Step bolts	46 off	
Plow bolts	57 off	

Stove Bolts		
In packages, nuts separate, 60-10 off; bulk 74 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.		
Nuts		
	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon		
¾-in. and smaller	51 off	48 off
¾-in. and smaller	48 off	47 off
¾-in.-1-in.		45 off
1½-in.-1½-in.	46 off	44 off
1½-in. and larger		44 off
Additional discount of 15 for full containers.		

Hexagon Cap Screws	
Upset 1-in., smaller (10-20 bright)	56 off
Upset (10-35 heat treated)	
¾ x 6	51 off
¾, ¾, & 1 x 6	47 off

Square Head Set Screws	
Upset 1-in. and smaller	61 off
Headless, ¾-in. and larger	46 off
No. 10 and smaller	56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham	
Structural	5.25c
Lebanon, Pa.	5.40c
¾-in. and under	55-5 off
Lebanon, Pa.	55-5 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, 1c1 \$1.50-\$2.00 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per bbl; reg. carbon 16.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	74.00c
1.5	4	1	8.5	59.00c
12	3	0.50	5	62.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb					
Bars, Drawn	Wire, Structural	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301...	26.00c	29.50c	37.00c	22.00c	28.00c
302...	26.00	29.50	37.00	23.50	30.50
303...	28.50	31.50	39.00	29.50	36.00
304...	27.50	31.50	39.00	25.50	32.50
308...	31.50	37.00	44.50	31.00	38.00
309...	39.00	43.50	51.00	40.50	51.00
310...	53.50	56.50	57.50	53.00	61.00
316...	43.50	48.00	52.00	43.50	52.00
321...	31.50	37.00	44.50	32.00	41.50
347...	36.00	41.50	49.00	36.00	45.50
431...	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50

STRAIGHT CHROMIUM STEEL					
403...	23.50	27.00	32.00	23.00	29.50
416...	20.50	23.50	29.00	18.50	24.00
416...	21.00	24.00	29.50	20.00	25.50
420...	26.00	31.00	36.50	26.00	39.50
430...	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442...	24.50	28.00	35.50	26.00	35.00
443...	24.50	28.00	35.50	26.00	35.00
446...	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50

†STAINLESS CLAD STEEL (20%)			
304...	24.00	22.00	...
410...	22.00	20.00	...
430...	22.50	20.50	...
446...	29.00	27.00	...

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

Pig Iron

Prices per gross ton

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base.....	\$34.50	\$34.00	\$35.50	\$35.00
Newark, N. J., del.	36.34	35.84	37.34	36.84
Brooklyn, N. Y., del.	37.50	.....	.....	38.00
Birdsboro, Pa., base.....	34.50	34.00	35.50	35.00
Philadelphia, del.	36.02	35.52	37.02	36.52
Birmingham, base.....	29.88	29.38	34.50	.....
Baltimore, del.	36.28	.....	.....	.....
Chicago, del.	34.12	.....	.....	.....
Cincinnati, del.	34.75	34.25	.....	.....
Newark, N. J., del.	35.96	.....	.....	.....
Philadelphia, del.	35.13	.....	.....	.....
St. Louis, del.	33.87	33.37	.....	.....
Buffalo, base.....	33.00	32.50	34.00	33.50
Boston, del.	39.48	38.98	40.48	39.98
Rochester, del.	34.84	34.34	35.84	35.34
Syracuse, del.	35.50	35.00	36.50	36.00
Chicago, base.....	33.00	32.50	34.00	33.50
Milwaukee, del.	34.52	33.82	35.32	34.63
Muskegon, Mich., del.	36.83	.....	.....	37.83
Cleveland, fob furnace.....	33.00	32.50	34.00	33.50
Akron, del.	35.17	34.17	35.67	35.17
Duluth, base.....	33.50	33.00	34.50	34.00
Erie, Pa., base.....	33.00	32.50	34.00	33.50
Everett, Mass., base.....	29.50	29.00	30.50	30.00
Boston, del.	30.00	29.50	31.00	30.50
Granite City, Ill., base.....	33.50	33.00	.....	33.50
St. Louis, del.	34.25	33.75	.....	34.25
†Neville Island, Pa., base.....	33.50	33.00	34.00	33.50
Pittsburgh, del., N. & S. Sides	34.33	33.83	34.83	34.33
Provo, Utah, base.....	33.50	33.00	.....	.....
Seattle, Tacoma, Wash., del.	38.60	.....	.....	.....
Portland, Oreg., del.	38.60	.....	.....	.....
Sharpville, Pa., base.....	33.50	33.00	34.00	33.50
Steelton, Pa., base.....	34.50	34.00	35.50	35.00
Swedeland, Pa., base.....	35.50	35.00	36.50	36.00
Troy, N. Y., base.....	34.50	34.00	35.50	35.00
Toledo, O., base.....	33.00	32.50	34.00	33.50
Cincinnati, del.	36.50	36.00	.....	.....
Youngstown, O., base.....	33.50	33.00	34.00	33.50
Mansfield, O., del.	36.48	35.98	36.98	36.48

† To Neville Island base add: 66c for McKees Rocks, Pa.; \$1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa; 97c (waster), Monongahela; \$1.33, Oakmont, Verona; \$1.49 Brackenridge.

Exceptions to above prices: Kaiser-Frazer Parts Corp., Struthers, O., charges 50 cents a ton in excess of Sharpville, Pa., basing point price for No. 2 foundry, basic, bessemer and malleable pig iron.

High Silicon Silvery

6.00-6.50 per cent (base).....	\$40.50
6.51-7.00.	\$41.50
7.01-7.50.	\$42.50
7.51-8.00.	\$43.50
8.01-8.50.	\$44.50
8.51-9.00.	\$45.50
9.01-9.50.	\$46.50
9.51-10.00.	\$47.50
10.01-10.50.	\$48.50
10.51-11.00.	\$49.50
11.01-11.50.	\$50.50

Fob Jackson, O., per gross ton; Buffalo base \$1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon
Prices same as for high silicon silvery iron, plus \$1 per gross ton.

Electric Furnace Ferrosilicon: \$1 14.01-14.50, \$65.75, Jackson, O.; \$67, Niagara Falls; \$68, Keokuk, Iowa. Add \$1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; \$1 a ton for 0.045% max. phos.

Charcoal Pig Iron
Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn.... \$40.50
(For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point
Sheets, Hot-Rolled	3.75-3.85	3.75-3.85	3.75-3.85	3.85	3.85
Cold-Rolled	4.55-4.75	4.55-4.75	4.55-4.75	4.75	.....
Galvanized	5.40	.....	.....	.....	.....
Strip, Hot-Rolled	3.75-3.85	3.75-3.85	3.75-3.85	3.85	.....
Cold-Rolled	4.55	4.65	4.65	4.65	.....
Shapes, Structural	3.85	3.85	3.85	3.85	.....
Plates	4.10	4.10	4.10	4.10	.....
Bars and Bar Shapes..	4.00	4.00	4.00	4.00	.....

Note: Lower level of quoted ranges represent prices for NAX High Tensile, produced by Great Lakes Steel Corp., Detroit.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, furnace..	*\$8.75-\$9.50
Connellsville, foundry..	9.75-11.00
New River, foundry..	12.50
Wise county, foundry..	11.15
Wise county, furnace..	10.65

* Operators of hand-drawn ovens using trucked coal, \$9.35-\$10.10.

By-Product Foundry

Kearney, N. J., ovens.	\$15.35
Chicago, outside del..	15.10
Chicago, del.	16.10
Terre Haute, del.	15.60
Milwaukee, ovens	15.85
New England, del.	17.25
Birmingham, del.	12.35
Indianapolis, ovens	14.50
Cincinnati, del.	15.35
Ironton, O., ovens	13.35
Painesville, ovens	14.60
Cleveland, del.	15.90
Buffalo, del.	16.10
Detroit, del.	15.75
Philadelphia, ovens	14.50
Portsmouth, O., ovens	14.00
Fairmount, W. Va., ovens	13.75
Pittsburgh, del.	15.61

Coke By-Products

Spot, gal, freight allowed east of Omaha	
Pure and 90% benzol.....	17.00c
Toluol, two degrees.....	22.00c
Industrial xylol	22.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	9.50c
Per ton, bulk, fob plants	
Sulphate of ammonia.....	\$30.00

Refractories

Per 1000, fob shipping point Net Prices

Fire Clay Brick	
Super Duty	
Pa., Mo., Ky.	\$87.00
High Heat Duty	
Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	76.00
Intermediate Heat Duty	
Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00
Low Heat Duty	
Pa., Md., Ohio.....	56.00
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases 80.00

Silica Brick	
Pennsylvania	70.00
Joliet, E. Chicago.....	79.00
Birmingham, Ala.	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.	
Bulk	24.00
Single bags	28.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite.....	70.00

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports	
Old range bessemer.....	\$5.95
Old range nonbessemer.....	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.	
Foundry and basic 56-63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports	
N. African low phos.....	Nom.
Swedish basic, 60 to 68% ..	13.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro.....	7.50-8.00

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	\$27-\$28
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Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.	
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Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.	
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(S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2:1	\$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	\$27-\$27.50
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian-nominal	
44% 2.5:1 lump	\$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	\$27-27.50
48% no ratio	30.00
48% 3:1 lump	39.00

Domestic (seller's nearest rail)

48% 3:1	\$39.00
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Molybdenum

Sulphide conc., lb., Mo. cont., mines	\$0.75
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Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF₂ content, 70% or more, \$33; 65% to 70%, \$32; 60% to 65%, \$31; less than 60%, \$30.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS						BARS		PLATES				
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	STRIP		H-R	C-F	H-R Alloy (\$41.40)	Structural Shapes	Carbon ¾"-¾"	Floor ¾" & Thicker
Boston (city)	4.50	5.67 ⁴	5.22 ⁴	5.55 ⁴	6.80 ⁴	4.65	6.36	4.62	5.22	7.12	4.47	4.70	6.42
† New York (city)	4.42	....	5.27 ⁸	5.47 ⁸	....	4.62	....	4.62	5.17	8.42 ¹²	4.37	4.72	6.35
New York (country)	4.32	....	5.17 ⁸	5.37 ⁸	....	4.52	....	4.52	....	....	4.27	....	6.25
Philadelphia (city)	4.24	5.79 ⁸	5.33 ⁹	5.29 ⁹	6.54 ⁹	4.43	5.28	4.48	5.38	6.87	4.22	4.44	5.93
Philadelphia (country)	4.14	5.63 ⁹	5.23 ⁹	5.19 ⁹	6.44 ⁹	4.33	5.18	4.38	....	6.60	4.12	4.84	5.83
Baltimore (city)	4.09	6.15 ⁸	5.65 ⁸	5.14 ⁸	6.39 ⁸	4.40	....	4.45	5.10	....	4.34	4.39	5.90
Baltimore (country)	3.59	6.05 ⁸	5.55 ⁸	....	....	....	....	....	....	....	4.24	4.29	5.80
Washington (city)	4.35	....	....	5.18 ⁸	6.43 ⁸	4.65	....	4.70	5.60 ¹³	....	4.60	4.65	6.60
Norfolk, Va.	4.35	....	....	....	....	....	....	4.75	5.50	....	4.50	4.50	6.25
Buffalo (city)	4.05	....	4.75 ⁸	5.35 ⁸	....	4.30	5.25	4.10	4.75	....	4.10	4.65	5.90
Buffalo (country)	3.90	....	4.60 ⁸	4.95 ⁸	....	3.90	4.85	3.95	4.60	6.60	3.95	4.20	5.45
Pittsburgh (city)	4.05	5.20 ⁸	4.75 ⁸	5.10 ⁸	6.35 ⁸	4.05	5.00	4.10	4.75	6.60	4.10	4.30	5.60
Pittsburgh (country)	3.90	5.05 ⁸	4.60 ⁸	4.95 ⁸	6.20 ⁸	3.90	4.85	3.95	4.60	6.60	3.95	4.15	5.45
Youngstown, O. (city)	4.188	5.338	4.888	5.05	6.30	4.00	....	4.238	5.138	....	4.218	4.488	5.178
Youngstown, O. (country) . . . . .	....	....	....	4.95	6.20	3.90	....	....	....	....	....	....	....
Detroit	4.15	5.30	4.85	5.42	6.67	4.34	5.24	4.20	4.87 ¹²	7.01	4.42	4.49	5.92
Cleveland (city)	4.05	5.20 ⁸	4.75 ⁸	5.238 ⁸	6.488 ⁸	4.188	5.10	4.10	4.75	6.858	4.311	4.25	5.961
Cleveland (country)	3.90	5.05 ⁸	4.60 ⁸	....	....	3.90	4.95	3.95	4.60	....	....	4.10	....
Cincinnati	4.116	5.266 ⁸	....	5.166 ⁸	....	4.394	....	4.403	5.303	....	4.444	4.453	5.944
Chicago (city)	4.05	5.20 ⁸	4.75 ⁸	5.10 ⁸	6.35 ⁸	4.05	5.10	4.10	4.75	6.60 ¹³	4.10	4.25	5.75
Chicago (country)	3.90	5.05 ⁸	4.60 ⁸	4.95 ⁸	6.20 ⁸	3.90	4.95	3.95	4.60	6.60 ¹³	3.95	4.10	5.60
Milwaukee	4.249	5.399 ⁸	4.949 ⁸	5.299 ⁸	6.549 ⁸	4.249	5.299	4.299	4.949	6.899	4.299	4.449	5.949
St. Paul	4.384 ¹	5.534 ⁸	5.084 ⁸	5.434 ⁸	6.684 ⁸	4.404 ¹³	....	4.434 ¹³	5.726 ¹³	7.084 ¹¹	4.434 ¹³	4.684 ¹³	6.084 ¹³
Indianapolis	4.04	....	4.84 ⁸	5.29 ⁸	6.54 ⁸	4.24	....	4.361 ¹¹	5.26	....	4.36	4.61	6.01
St. Louis	4.199	....	4.899 ⁹	....	6.674 ⁸	4.199	....	4.249	5.324 ¹²	7.074	3.999	3.999	5.999
Birmingham (city)	3.85 ²⁰	....	....	5.20 ⁸	....	4.10 ²⁰	....	4.05 ²⁰	5.83	....	4.05	4.30	6.56
Birmingham (country)	3.75 ²⁰	....	....	5.20 ⁸	....	4.00 ²⁰	....	3.95 ²⁰	....	....	3.95	4.20	....
New Orleans	4.46 ^{20,8}	....	5.77 ⁸	....	....	4.83 ²⁰	....	4.78 ^{20,8}	5.94 ¹¹	....	4.68 ^{20,8}	5.03 ²⁰	6.94 ²⁰
Houston, Tex.	5.00 ¹	....	....	6.00	....	6.00 ¹	....	5.35 ¹	....	6.35	5.85	5.85	6.40
Omaha, Nebr.	4.868	6.118 ⁸	....	5.918 ⁸	7.168 ⁸	4.862	....	4.918	5.818 ¹¹	....	4.918	5.068	6.568
Los Angeles	5.55	....	7.10 ⁸	....	8.10 ⁸	5.65	8.35	5.10	6.90 ¹⁸	7.85	5.20	5.10	7.20
San Francisco	4.90 [§]	6.30 ⁸	....	7.35 ⁸	5.20 ¹⁴	8.35 ¹⁴	4.75 ¹⁴	***	9.35 ¹⁰	4.90 ¹⁴	5.00 ¹⁴	6.80 ¹⁴
Tacoma, Wash. . . . .	....	....	6.30 ⁸	....	....	5.30 ¹⁷	....	5.00 ¹⁷	7.10 ¹⁹	8.50 ¹⁸	4.95 ¹⁷	5.15 ¹⁷	7.25 ¹⁷
Seattle	5.00 ¹⁷	....	....	6.30 ⁸	....	5.30 ¹⁷	....	5.00 ¹⁷	7.10 ¹⁹	8.50 ¹⁸	4.95 ¹⁷	5.15 ¹⁷	7.25 ¹⁷

Base Quantities: 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; ¹—any quantity; ²—300 to 1999 pounds; ³—150 to 2249 pounds; ⁴—three to 24 bundles; ⁵—450 to 1499 pounds; ⁶—one bundle to 1499 pounds; ⁷—one to nine bundles; ⁸—400 to 1499 pounds; ⁹—1000 to 1999 pounds; ¹⁰—450 to 39,999 pounds; ¹¹—1000 to 39,999 pounds; ¹²—1000 pounds and over; ¹³—400 to 14,999 pounds; ¹⁴—400 to 39,999; ¹⁵—2000 lb and over; ¹⁶—1000 to 4999; ¹⁷—300 to 9999 pounds; ¹⁸—1500 to 1999 pounds; ¹⁹—1500 to 39,999; ²⁰—400 to 3999 pounds.

¹ Includes gage and coating ext. a, except Birmingham (coating extra excluded); [†] does not include gage extras; [‡] basing point cities with quotations representing mill prices plus warehouse spread; [§] as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; ^{||} add 0.46 for sizes not rolled in Birmingham; [¶] same prices quoted for Jersey City, N. J.; ^{||} add 15c for 100 lb for slow moving items; ^{§§} 18 gage and heavier; ^{***} rounds under 3/4 in. 7.00c, 3/4 in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegelisen: 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., \$44; Pittsburgh, \$48. 16% to 19% Mn, Pittsburgh, \$47.

Ferromanganese, standard: 78-82% c.i. gross ton, duty paid, \$135 for cars, Baltimore, Philadelphia, St. Louis, New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); \$140.25 for cars, Pittsburgh, including 75c switching charge, (where Carnegie-Illinois Steel Corp. is producer); add \$8 for packed c.i., \$10 for ton, \$13.50 for less ton; \$1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, \$2.10; contract, \$2.08; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots \$1.23; smaller lots \$1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots \$1.35; smaller lots \$1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, \$142.50; 3-5% C, \$157.50.

Ferrovandium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of \$3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.i. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75% c.i. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50% c.i. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots \$1.20, smaller lots \$1.30, eastern, freight allowed; \$1.2075 and \$1.3075 central; \$1.229 and \$1.329, western; spot add 1.25c.

Ferrocolumbium: 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, \$2.50; smaller lots \$2.55. Spot up 10c.

Ferrocrome: Contract, lump, packed; high carbon, eastern zone, c.i. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. High carbon, high nitrogen, add 5c to all high carbon ferrocrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. Low carbon, eastern zone, bulk, c.i., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.i.; central zone, add 0.4c for bulk, c.i.; and 0.65c for 2000 lb to c.i.; western zone, add 0.5c for bulk, c.i., and 1.85c for 2000 lb to c.i.; carlot and packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

Low carbon, high nitrogen: Add 2c to low carbon ferrocrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrocrome, Special Foundry: (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.i. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.i. and 1.30c for smaller lots; western zone, add 0.55c for c.i. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots.

S. M. Ferrocrome, high carbon: (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.i. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.i. and 1.30c for smaller lots; western zone, add 0.55c for c.i. and 2.10c for smaller lots. Prices are per pound

of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrocrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrocrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.i. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.i. and 0.90c for smaller lots; western zone, add 0.55c for c.i. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched, 0.25c higher.

Chromium Metal: 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.i. 79.50c, 2000 lb to c.i. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max.; Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; east: Contract, ton lot or more, \$1.60; 100 to 1999 lb, \$1.95; less than 100 lb, \$3.15 per lb of metal, eastern zone; \$1.615, \$1.965 and \$3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium-silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l. 14.10c; 2000 lb to c.l. 15.60c; central 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about 1/2 lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2 1/2 lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central

zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb drum; Carlots 32c, ton lots 34c, cr more lots 36c, less than drum lot 38c. Add 1 1/4c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots \$1.89, less \$2.01, eastern, freight allowed; \$1.903 and \$2.023, central; \$1.935 and \$2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni balance). Prices per lb of alloy: Contract, 5 tons or more \$1.90, 1 ton to 5 tons \$2.00, smaller lots \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; \$6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Prices per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

CM5Z Alloys 4 & 5: (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern,

freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

Zirconium alloy: Zr 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsilfer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up 1/4c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 98.8%, \$2.80, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V₂O₅ and 5.84% Na₂O; or air dried, 83-85% V₂O₅ and 5.15% Na₂O, \$1.10 per lb contained V₂O₅, fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Nonferrous Metal Prices Still Hold

NEW YORK — Trading in the domestic nonferrous metal market remained limited last week at steady price levels.

About half of the surplus aluminum and other nonferrous metal plants have been sold by the government, according to a statement last week by the War Assets Administration. Aluminum plants, having an original cost of \$654,400,000, have been declared surplus; of these, plants costing originally \$387,800,000 have been sold or leased. This leaves \$277,600,000 in surplus aluminum plants and equipment still awaiting disposal.

All aluminum reduction plants capable of economical peacetime operation have been disposed of.

Copper, brass and other nonferrous metal plants originally costing \$106,807,594 have been declared surplus. Production facilities representing \$49,928,175 in original cost have been disposed of by WAA.

COPPER — A three-way price market for copper now exists in this country. The price of 21.50c a pound for domestic-mined metal is quoted by major producing sources. A price of 24.00c a pound, delivered Connecticut Valley, is being paid by American users for foreign-mined metal. The average price between the foreign copper quotation and the domestic price will be paid under many contracts which specify that the purchase price be the average price prevailing on the date of shipment. Sales last week of foreign copper at 24.00c were the first transactions to be recorded since the two-year suspension of the 4-cent copper import tax.

This price situation is expected to cause confusion among both buyers and sellers. Some market observers are wondering just how long a triple price structure will prevail. They say that a three-way price situation will be disturbing to manufacturers of copper goods since they will have difficulty in setting a price on their finished materials.

Although imports will bolster supplies here, users are still uncertain as to the

Domestic copper sells at 21.50c but foreign metal remains at 24.00c. New inquiry generally light

supply of copper, one of them saying that the situation is "touch and go" and as a result it is difficult to figure ahead. Morris F. LaCroix, president, Copper Range Co., told stockholders last week that there is a current shortage of 30,000 to 40,000 tons of copper a month and that cutbacks already have begun to appear in the country's fabricating plants.

LEAD — Practically all supplies of lead that will be available for May delivery have been booked and June supplies are being absorbed rapidly, about 20 per cent already having been sold. Prices were unchanged last week at 14.80c to 14.85c, East St. Louis. The daily average rate of lead receipts and consumption of, and recovery from, lead-base scrap by secondary smelters increased in February, according to the Bureau of Mines. Net receipts of lead-base scrap totaled 56,550 tons, consumption 50,904 tons and secondary metal recovered amounted to 41,425 tons. While scrap lead has come out in larger volume recently, most reports continue to call the supply "tight," except in the case of battery plates.

ZINC — Allocating machinery of the government started to function again last week, but it is questionable whether much metal can still be released in time to make May delivery. Requests for allocations are being received by the Office of Materials Distribution, Department of Commerce. Horace B. McCoy is director of the new office while Frank H. Hayes is chief of the Metals Division.

TIN — Production at the Longhorn tin smelter held up well in April in view of some detrimental external influences which were caused by the catastrophe at Texas City, Tex., during the latter part of the month. Output totaled 2816 tons

in April compared with 2877 tons in March and 3891 tons in April, 1946. The rate of production so far this year has been about 35,000 tons as against an output of 43,468 tons in 1946.

Reconstruction Finance Corp. continues to make small purchases of Chinese tin from private holders but the tonnage does not aggregate more than 400 tons, according to reliable trade reports. Due to the inflation in China, production of tin in that country is negligible and it is doubtful whether it will total 1000 tons in 1947. Production in Netherlands East Indies also has been disrupted, unconfirmed reports being that the Billiton tin miners are on strike. Billiton's output this year had been expected to more nearly approach prewar levels than any other company operating in Malaya, Siam, Burma, or the Netherlands East Indies.

Prices here remained unchanged last week on the basis of 80.00c for grade A.

SILVER — Prices fluctuated between 71.75c and 73.75c per fine ounce last week with the close quoted 72.75c. At the low point last week, the market was within 1 cent of the year's low of 70.75c recorded on Jan. 20. The high for the year to date was 86.25c on Mar. 6.

PLATINUM — Prices in the domestic market declined \$4 an ounce last week to \$59 an ounce wholesale and \$62 retail. The reduction resulted from an influx of additional supplies believed to be of Russian origin. While demand for platinum from industrial users remains good, demand for the jewelry trade is limited. Leading British platinum refiners reduced their prices to £15 last week from £15 15s, due to renewed offers of Russian platinum to the unresponsive American market.

ALUMINUM — Monthly production of aluminum alloy ingot by secondary smelters declined sharply in February to 18,732 tons, due mainly to inclement weather. Primary aluminum ingot prices held unchanged at 15.00c a pound.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, del. Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¼c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 21.25c, refinery, 20,000 lb or more; 21.50c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 20.50c; 88-10-2 (No. 215) 27.25c; 80-10-10 (No. 305) 24.50c; No. 1 yellow (No. 405) 16.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ¼c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 15.00c-15.25c; No. 12 foundry alloy (No. 2 grade) 14.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97¼%) 15.50c; grade 2 (92-95%) 14.50c; grade 3 (90-92%) 13.75c; grade 4 (85-90%) 13.25c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1½c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlot; 22.50c 100 lb to c.l. Extruded 12-in. sticks 34.00c-38.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99.49-99% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c, 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ¼c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, \$85-\$88 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, \$14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms \$1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, \$1.80.

Cobalt: 97-98%, \$1.50 lb for 550 lb (keg); \$1.52 lb for 100 lb (case); \$1.57 lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Indium: 99.9%, \$2.25 per troy ounce.

Silver: Open market, N. Y., 71.75c per ounce.

Platinum: \$59-\$62 per ounce.

Palladium: \$24 per troy ounce.

Iridium: \$85-\$95 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 32.93c; yellow brass 28.88c; commercial bronze, 95% 32.97c, 90% 32.36c red brass, 85% 31.24c, 80% 30.63c; best quality 29.89c; Everdur, Duronze, Herculey or equiv., cold-drawn, 37.71c; nickel silver, 18%, 41.54c; phosphor bronze, grade A, 5%, 50.75c.

Rods: Copper, hot rolled 29.28c, cold drawn 30.28c; yellow brass, free cutting, 23.64c, not free cutting 28.57c; commercial bronze, 95% 32.66c, 90% 32.05c; red brass, 85% 30.93c, 80% 30.32c; best quality 29.58c.

Seamless Tubing: Copper 32.97c; yellow brass 31.64c; commercial bronze 90% 34.77c; red brass 85% 33.90c, 80% 33.29c; best quality brass 32.30c.

Copper Wire: Bare, soft, fob eastern mills, carlots 27.72c, less carlots 28.22c; weatherproof, fob eastern mills carlots 28.12c, less carlots 28.62c; magnet, delivered, carlots 31.13c, 15,000 lb or more 31.38c, less carlots 31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per 100 lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 13.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electro-deposited, 29.09c; cast, 28.84c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz balls, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c, 500 to 1000 lb, 95.25c, 200 to 500 lb, 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.

To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.

To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

Prices for less than 15,000 lb fob shipping point. Add ¼c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250

Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750

Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.093
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS

BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.00c, No. 2 copper 17.00, light copper 16.00, composition red brass 15.75, auto radiators 12.25, heavy yellow brass 11.25, brass pipe 11.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper, 19.50-19.75; No. 2 copper, 18.50-18.75, light copper, 17.25-17.50; refinery brass (60% copper), per dry copper content less \$5 smelting charge for brass analyzing 60 per cent or more, 17.62½c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire, No. 1 16.50-17.00; No. 2 15.50-16.00; light copper 14.25-14.75; No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.50-9.00, new brass clippings 12.50-13.00, No. 1 brass rod turnings 13.00-13.50, light brass 7.25-7.75, heavy yellow brass 8.50-9.00, new brass rod ends 13.50-13.75, auto radiators, unsweated 10.00-10.50, clean red car boxes 12.00-12.50, cocks and faucets 10.50-11.00, brass pipe 9.75-10.25.

Lead: Heavy lead 12.50, battery plates 7.50-7.75, linotype and stereotype 12.75-13.25, electrolyte 10.75-11.25, mixed babbitt 13.50-14.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.50-6.00, new die cast scrap 4.50-5.00, old die cast scrap 3.50-4.00.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 8.50-9.00, old sheets 7.00-7.25, crankcase 7.00-7.25, borings and turnings 2.00, pistons, free of struts, 5.50-6.00.

Nickel: Anodes 19.50-20.50, turnings 16.50-17.50, rod ends 19.00-20.00.

Monel: Clippings 14.00-15.00, turnings 9.00, old sheet 12.00-13.00, rods 12.50-13.00, castings 10.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	\$30.00
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling	30.00
Nos. 1, 2 & 3 Bundles	30.00
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	26.00-27.00
Short Shovel Turnings	28.00-29.00
Cast Iron Borings	27.00-28.00
Bar Crops and Plate	37.00-37.50
Low Phos. Cast Steel	37.00-37.50
Punchings & Plate Scrap	37.00-37.50
Elec. Furnace Bundles	37.00-37.50
Heavy Turnings	31.00-31.50
Alloy Free Turnings	29.50-30.00
Cut Structural	39.00-40.00
No. 1 Chemical Borings	31.00-32.00

Cast Iron Grades

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast	33.00-34.00
Stove Plate	37.50-38.00
Unstripped Motor Blocks	37.50-38.00
Malleable	45.50-46.00
Brake Shoes	35.00-36.00
Clean Auto Cast	41.50-42.50
No. 1 Wheels	42.00-42.50
Burnt Cast	35.00-36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	34.00-34.50
R.R. Malleable	41.00-42.00
Axles	40.00-41.00
Rails, Rerolling	37.00-37.50
Rails, Random Lengths	35.00-36.00
Rails, 3 ft and under	33.00-33.50
Rails, 18 in. and under	33.50-34.00
Railroad Specialties	41.00-41.50
Uncut Tires	37.00-38.00
Angles, Splice Bars	37.00-38.00

† Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	\$30.50-31.00
No. 2 Heavy Melt. Steel	30.50-31.00
No. 1 Busheling	30.50-31.00
Nos. 1 & 2 Bundles	30.50-31.00
Machine Shop Turnings	25.50-26.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	27.00-28.00
Bar Crops and Plate	33.50-34.50
Cast Steel	33.50-34.50
Punchings & Plate Scrap	33.50-34.50
Elec. Furnace Bundles	31.50-32.00
Heavy Turnings	30.00-30.50
Alloy Free Turnings	29.50-30.00
Cut Structural	37.50-38.00

Cast Iron Grades

No. 1 Cupola	43.00-45.00
Charging Box Cast	38.00
Stove Plate	38.00
Heavy Breakable Cast	38.00
Unstripped Motor Blocks	40.00
Malleable	52.00-55.00
Brake Shoes	42.00
Clean Auto Cast	45.00
No. 1 Wheels	42.00
Burnt Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-35.00
R.R. Malleable	52.00-55.00
Rails, Rerolling	40.00-41.00
Rails, Random Lengths	38.00-39.00
Rails, 3 ft and under	44.00
Railroad Specialties	42.00
Uncut Tires	41.00
Angles, Splice Bars	44.00

VALLEY

No. 1 Heavy Melt. Steel	\$30.00-31.50
No. 2 Heavy Melt. Steel	30.00-31.50
No. 1 Bundles	30.00-31.50
Machine Shop Turnings	26.00-27.00
Short Shovel Turnings	28.00-29.50
Cast Iron Borings	28.50-29.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-35.00
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MANSFIELD

No. 1 Heavy Melt. Steel	\$31.00-31.50
Machine Shop Turnings	26.00
Short Shovel Turnings	28.00

CINCINNATI

No. 1 Heavy Melt. Steel	\$29.00
No. 2 Heavy Melt. Steel	29.00
No. 1 Busheling	29.00
No. 1 Bundles	29.00
No. 2 Bundles	29.00
Machine Shop Turnings	22.00
Mixed Borings, Turnings	20.00
Short Shovel Turnings	23.00
Cast Iron Borings	23.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	31.00
Heavy Breakable Cast	33.00
Stove Plate	29.00
Unstripped Motor Blocks	32.00
Brake Shoes	28.00
Clean Auto Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00
R.R. Malleable	42.00
Rails, Rerolling	35.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	42.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	\$24.50-25.00
No. 1 Busheling	24.50-25.00
Nos. 1 & 2 Bundles	24.50-25.00
No. 3 Bundles	24.50-25.00
Machine Shop Turnings	21.50-22.00
Mixed Borings, Turnings	21.50-22.00
Short Shovel Turnings	22.50-23.00
Cast Iron Borings	22.50-23.00
Punchings & Plate Scrap	30.00-30.50

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Heavy Breakable Cast	25.00-27.00
Clean Auto Cast	33.00-34.00

BUFFALO

No. 1 Heavy Melt. Steel	\$31.00-33.00
No. 2 Heavy Melt. Steel	29.00-31.00
No. 1 Busheling	29.00-31.00
Nos. 1 & 2 Bundles	29.00-31.00
Machine Shop Turnings	22.00-22.50
Mixed Borings, Turnings	22.00-22.50
Cast Iron Borings	22.00-22.50
Short Shovel Turnings	24.00-24.50
Punchings & Plate Scrap	32.00-34.00
Elec. Furnace Bundles	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	37.00-40.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast	34.00-35.00
Stove Plate	33.00-35.00
Malleable	40.00-41.00
Clean Auto Cast	38.00-39.00
No. 1 Wheels	38.00-39.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	\$29.00-30.00
No. 2 Heavy Melt. Steel	27.50-28.00
No. 1 Busheling	27.50-28.00
No. 1 Bundles	29.00-30.00
No. 2 Bundles	25.50-26.00
No. 3 Bundles	23.50-24.00
Machine Shop Turnings	22.50-23.00
Mixed Borings, Turnings	20.50-21.00
Short Shovel Turnings	23.50-24.00
Bar Crops and Plate	31.00-32.00
Punchings & Plate Scrap	31.00-32.00
Cut Structural	31.00-32.00
Elec. Furnace Bundles	30.00-31.00
Heavy Turnings	29.50-30.00
No. 1 Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast	38.00-39.00

Unstripped Motor Blocks	36.50-37.00
Malleable	48.00-49.00
Clean Auto Cast	40.00-42.00
No. 1 Wheels	42.00-43.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	\$24.00-25.00
No. 2 Heavy Melt. Steel	24.00-25.00
No. 1 Busheling	23.00-25.00
Nos. 1 & 2 Bundles	25.00
No. 3 Bundles	23.00
Machine Shop Turnings	17.50
Mixed Borings, Turnings	17.50
Short Shovel Turnings	18.50
Punchings & Plate Scrap	27.00-28.00
Elec. Furnace Bundles	26.00
Cut Structural	27.00-28.00
No. 1 Chemical Borings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Charging Box Cast	38.00-40.00
Unstripped Motor Blocks	35.00-36.00
Malleable	48.00-49.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	\$23.00-23.50
No. 2 Heavy Melt. Steel	23.00-23.50
Nos. 1 & 2 Bundles	23.00-23.50
No. 1 Busheling	21.00-21.50
Machine Shop Turnings	17.00-17.50
Mixed Borings, Turnings	16.00-17.00
Short Shovel Turnings	18.00-19.00
Bar Crops and Plate	27.00-28.00
Punchings & Plate Scrap	27.00-28.00
Chemical Borings	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-40.00
Charging Box Cast	36.00-37.00
Heavy Breakable Cast	38.00-39.00
Stove Plate	35.00
Unstripped Motor Blocks	33.50-34.50
Clean Auto Cast	40.00-41.00

CHICAGO

No. 1 Heavy Melt. Steel	\$28.00-28.50
No. 2 Heavy Melt. Steel	28.00-28.50
Nos. 1 & 2 Bundles	28.00-28.50
No. 3 Bundles	26.00-26.50
Machine Shop Turnings	22.50-23.50
Mixed Borings, Turnings	22.50-23.50
Short Shovel Turnings	24.50-25.50
Cast Iron Borings	23.50-24.50
Bar Crops and Plate	30.50-31.00
Cast Steel	30.50-31.00
Punchings	30.50-31.00
Elec. Furnace Bundles	29.00-29.50
Heavy Turnings	27.50-28.00
Cut Structural	30.00-30.50

Cast Iron Grades

No. 1 Cupola Cast	35.00-40.00
Malleable	35.00-40.00
Clean Auto Cast	35.00-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	29.00-29.50
Rails, Rerolling	33.00-34.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under	36.00-37.00
Rails, 18 in. and under	37.00-38.00
Railroad Specialties	34.00-35.00
Angles, Splice Bars	34.00-35.00

ST. LOUIS

No. 1 Heavy Melt. Steel	\$29.00-30.00
No. 2 Heavy Melt. Steel	29.00-30.00
Machine Shop Turnings	21.00-22.00
Short Shovel Turnings	21.00-22.00

Cast Iron Grades

(Fob shipping point)

No. 1 Cupola Cast	37.00-38.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast	30.00-33.00
Stove Plate	30.00-33.00

Brake Shoes	31.00-33.00
Clean Auto Cast	37.00-38.00
No. 1 Wheels	34.00-36.00
Burnt Cast	30.00-32.00

Railroad Scrap

R.R. Malleable	40.00-45.00
Rails, Rerolling	30.00-33.00
Rails, Random Lengths	29.00-30.00
Rails, 3 ft and under	36.00-37.00
Uncut Tires	32.00-34.00
Angles, Splice Bars	34.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	\$29.00-30.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
Nos. 1 & 2 Bundles	29.00-30.00
Long Turnings	23.00
Short Shovel Turnings	25.00
Cast Iron Borings	24.00
Bar Crops and Plate	32.00-33.00
Punchings & Plate Scrap	36.00-37.00
Cut Structural	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	37.00-39.00
Stove Plate	35.00-36.00
No. 1 Wheels	32.00-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	29.50-30.00
R.R. Malleable	37.50-38.00
Axles, Steel	33.00
Rails, Rerolling	36.00-37.00
Rails, Random Length	30.00-31.00
Rails, 3 ft and under	32.00-33.00
Angles and Splice Bars	32.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	\$19.04
No. 2 Heavy Melt. Steel	19.04
No. 1 Busheling	19.04
Nos. 1 & 2 Bundles	19.04
No. 3 Bundles	17.04
Machine Shop Turnings	12.54
Bar Crops and Plate	18.00
Cast Steel	18.00
Alloy Free Turnings	8.00
Cut Structural	20.00-20.50
Tin Can Bundles	17.00

Railroad Scrap

Axles	26.50
Rails, Random Lengths	21.00
Uncut Tires	28.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	\$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	20.00
No. 3 Bundles	18.00
Machine Shop Turnings	11.50
Mixed Borings, Turnings	11.50
Punchings & Plate Scrap	21.50
Cut Structural	21.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50
Nos. 1 & 2 Bundles	19.50
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	27.50
Elec. Furnace Bundles	27.00

Cast Iron Grades

No. 1 Cupola Cast	30.00
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LOGEMANN

Presses for Sheet Scrap

THE NATION NEEDS YOUR SHEET SCRAP!

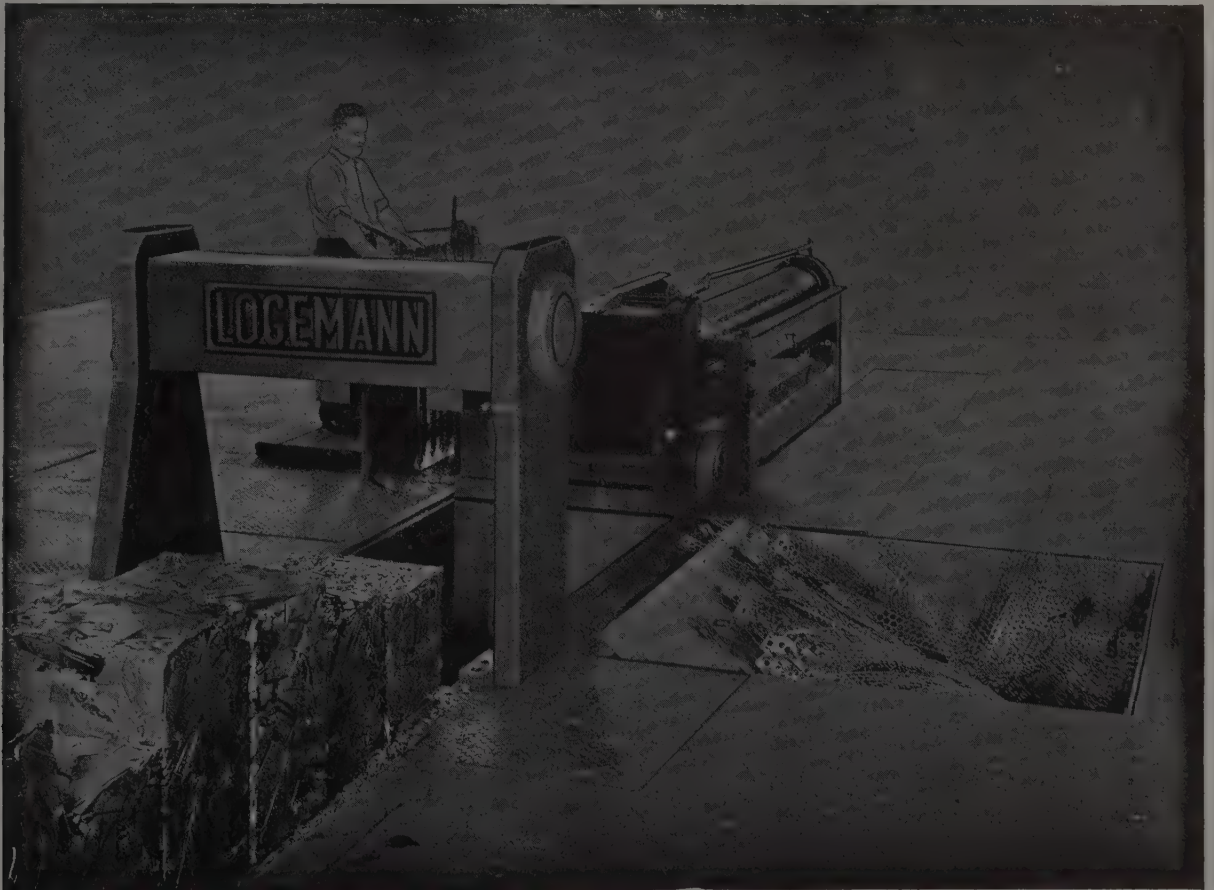
In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill Service*, presses *designed for automobile plant conditions*, presses *designed for general plant applications*. Write for details.

LOGEMANN BROTHERS COMPANY
3126 W. Burleigh St. Milwaukee, Wisconsin

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.



Sheets, Strip . . .

Buyers are more exacting in specifications but still press for early delivery

Sheet Prices, Page 162

New York—An increasing note of caution is noted in steel buying generally and this even applies to sheets, one of the most stringent major items on the list. There is still an excess of demand, with consumers as a whole not getting as much tonnage as they would like to have; however, they are becoming more exacting in their specifications and are

not so willing to take substitute sizes or grades as they were. Further, there is decidedly less interest in black market tonnage. An occasional lot is still reported as going at near-peak premiums but it is becoming the increasing exception and in general black market prices on sheets have dropped rather noticeably.

Over the past week or so producers have been opening their books for third quarter with quotas for their customers in general a little larger than for the current period. The increase in freight car allocations for next quarter will be a little heavier at around 23,000 for a month, which is at the expense of most of the other customers. Nevertheless, high operations this quarter should reduce ar-

rearages somewhat and, if uninterrupted in the third quarter, should further ease the general picture. Housing requirements are expected to be allocated on the same basis as for the present quarter.

The only grade on which there is any real easiness is stainless sheets, with delivery available within a few weeks. Competition for this material, however, has not become so keen as to result in any price concessions.

Boston — Except for stainless sheet and strip, supply of flat-rolled products remains below requirements with indications that volume will be limited at about present levels through the third quarter. Few increases in allocations for that period are planned and minor cancellations, deferments and order revisions are readily filled with waiting tonnage. Lack of sheets and strip is hampering production at some assembly plants, affecting purchase of other steel products and finished products. Supply of electrical and enameling sheets are below requirements with demand running well above prewar levels. Probably shortest of all finishes is galvanized sheet.

The housing program is turning sour in some directions due to high costs with likelihood that sheet needs will be below earlier high estimates. On the other hand, car building requirements are mounting.

Massachusetts has placed a contract for 1949 automobile license tag stock with Youngstown Sheet & Tube Co., deliveries to start moderately in October of this year. The contract is for about 800 tons of hot-rolled, pickled, 24 gage material.

Pittsburgh — Sharon Steel Corp., Sharon, Pa., has issued a new extra card, superseding all previous lists, on low-carbon cold-rolled strip and spring steel. The new card follows the revisions in size extras for the various higher carbon ranges put into effect earlier this year by other producers. Packaging extras have been made uniform with those now in effect on hot-rolled strip.

Sellers report only a few isolated order deferments or cancellations. For bulk of customers pressure for prompt delivery remains as great as at any time in recent months. The third-quarter quota distribution pattern is little changed from the current period on the basis of present projected production schedules. Reports from automotive, electrical appliances and other important consumer groups are to the effect that production schedules remain restricted to limited tonnage of steel on hand. Stainless and alloy sheet items appear to be the only exception to the current active demand situation for sheet and strip.

Some relief in the present tight sheet and strip supplies is expected later this year as new facilities, now under construction, are brought into operation. However, this increased capacity will be offset in part because some mills will be forced down to permit installation of new "drives" under the modernization programs being carried out by most producers.

Philadelphia — One district sheet seller, with four mills, has closed down one of them for the current month for repairs and will close down two others, including a specialty mill, for June for the same reason. Meanwhile, third quarter quotas are being announced by various mills, with regular customers scheduled to receive a little more on a general

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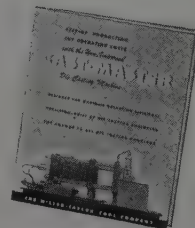
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average than currently. However, at least one large producer asserts that most of his customers will receive no more than they are now getting, due in part to heavier commitments for the railroad car program.

Chicago — Consumers of sheets and strip and other flat rolled products who are customers of Inland Steel Co. stand to suffer from the seven-day strike which that company has just suffered. All production operations were suspended for that period and it is estimated that close to three weeks will be required to restore operations to the level prevailing before the strike. Output loss will likely total in excess of two weeks full production. Sheet users still are clamoring for all the tonnage they can get and with all mills have specified up to the maximum of the allocations assigned to them. Certain evidences of curtailed manufacturing of consumer goods have not yet been reflected back to mills.

St. Louis — Sheet production here is down to 30 per cent of capacity due to a machinists' strike at Granite City Steel Co. Sufficient labor isn't available for re-lining of furnaces and ladles. Prospects are good, however, for early settlement. Order books for 1947 remain closed in an effort to catch up on backlogs. Pressure is greatest for cold-rolled sheets, which are nearly a year behind schedule. Completion of a new cold mill this summer, however, is expected to bring orders current by the year-end. Electrical and galvanized sheets likewise are extended to November or December. There is no sign of easing demand in any items. Thus housing, stove making, farm equipment and even the kitchen utensil industries are pressing hard for shipments.

Wire . . .

Wire Prices, Page 163

Chicago — Consumers of wire and wire products are evincing considerable disappointment over third quarter wire quotas which have been set by the mills, since they feel that continuous high production should permit substantial increases. Merchant products in greatest need are baling wire, bale ties, barbed wire and fence posts. However, current heavy requirements reflect the situation created recently when certain large eastern interests withdrew from this area. In spite of all this, there are signs developing that return of a buyers' market is not too far off.

Philadelphia—Two independent manufacturers of wire rope are changing their method of quoting to a net price basis with resultant increases, which vary in relation to the different items.

Steel Bars . . .

Bar Prices, Page 162

New York — Small sized carbon bars remain in as tight supply as ever, with consumers reporting little or no change in their quotas for third quarter. Large rounds are in fairly easy supply and perhaps there is a little freer supply in medium sizes, but the latter situation has not softened appreciably. Cold-drawn carbon bars are in easier supply in the medium sizes as well as the larger, but little if any improvement is noted in the delivery promises on the very small items. Alloy bars can be had for early delivery.

Boston — Supply of cold-drawn carbon bars down to the smaller range of sizes is likely to improve in the third quarter. Some producers are not allocating cold-rolled tonnage and are accepting orders for July-August delivery to wire sizes. Backing up of finished screw machine parts at some textile equipment building shops because of lack of flat-rolled products for side panels for completion of assemblies is opening up some volume for other consumers. Demand for multiple-produced screw machine products is supporting cold-drawn demand substantially. However, smaller sizes of cold-drawn bars are tight, although buying of hot-rolled carbon bars is more conservative. Some consum-

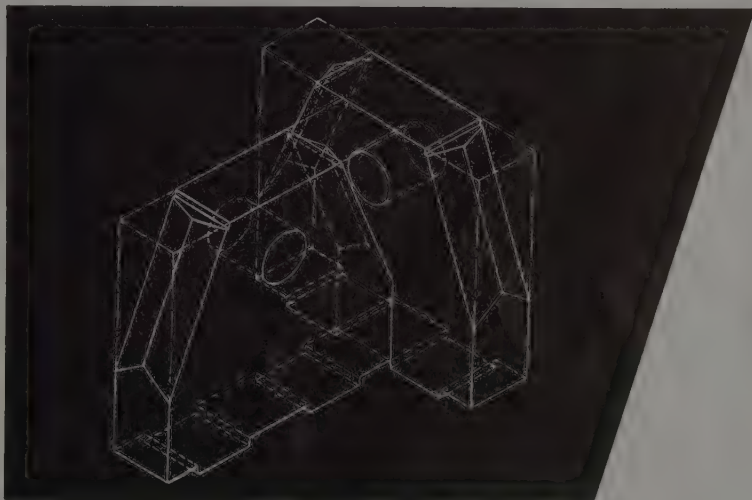
ers are covering firmly for July on definite tonnages but are leaving open August and September for fixed specifications. Alloys, tool steel and some specialties are in ample supply for current demand, but deliveries of cold-drawn, ground, heat-treated and other processed stock are extended.

Chicago — Demand for carbon bars in the smaller sizes holds exceedingly strong and users have specified and are taking delivery on all tonnage due them under mill quotas. Some easiness still holds on the larger sizes of bars and on alloys. Inland Steel Co. probably will suffer loss of between two and three weeks full production because of its seven-day strike during new contract nego-



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tations. This is bad news to the customers of this company, for even before the strike the situation was tightening under impetus of the expanding railroad freight car building program.

St. Louis — Pressure on merchant bars is unrelenting, although backlogs have been reduced to six months. Pig shortages have prevented scheduling as much bar production as would have been possible otherwise. Concrete bars are available in 30 days, however.

Steel Plate . . .

Plate Prices, Page 163

New York — Plate demand continues well in excess of available supply, al-

though some trade leaders expect the situation to be brought into fair balance by late in third quarter, assuming uninterrupted production. As a matter of fact, while there is greater demand than the mills can adequately cope with at present, some of the larger producers are making headway in reducing their order backlogs.

Fabricators of light tanks appear to be the hardest hit, although makers of large line pipe report continued difficulty in getting sufficient plate to come anywhere near their requirements. One middle western fabricator of large pipe is said to be operating at about 50 per cent of normal capacity because of lack of plates.

Boston — Continued stringency in

plates will extend through the third quarter and to what extent any easing in the fourth period may be expected depends on full, uninterrupted production. Warehouses are especially short of plates in wanted range of sizes and consumers are hampered notably by inability to buy fill-in requirements.

Pittsburgh — On basis of present distribution pattern, mills report no openings in operating schedules through rest of this year. Producers have not been able to make significant progress in overcoming extended order backlogs despite exceptionally good production record to date this year. Most fabricators are well behind delivery schedules due to shortage of steel and disruption to production earlier this year resulting from scarcity of industrial gas. Weirton Steel Co. recently awarded Dravo Engineering Works Division of Dravo Corp., Pittsburgh, an order for 10 standard steel barges calling for delivery in September and November. Freight car construction program is taking an increasing proportion of current plate output; one interest states production for this program constitutes 20 per cent of overall output.

Philadelphia — Plate mills are selecting new tonnage carefully, and while they are cutting into backlogs it is still due primarily to this selectivity. One or two mills continue practically out of the market. On the other hand, one consumer recently canceled some premium-priced tonnage he had had on the books of one mill for future shipment on the theory a little later he would be able to obtain it at the general market price.

Seattle — Plates continue in short supply and plants are limited by small inventories. Operations are near capacity but confined largely to jobs involving minor tonnages. The potential demand in this area is of major proportions.

Tin Plate . . .

Tin Plate Prices, Page 163

Pittsburgh — Continuation of quarterly tin plate export directive allotments is indicated through first quarter of next year. Of the 120,000 tons of tin plate scheduled for export next quarter, all except 20,000 tons will be subject to priority orders. Producers point out that specifications for July rolling must be in by May 15 and that for August by June 15. Regulations governing tin coatings are expected to remain in effect well into next year for no easing in pig tin supply is indicated until possibly 1949.

There is some indication that pressure for tin plate shipments may be eased somewhat through lessened requirements from perishable food packers and increased production facilities scheduled to be operating later this year. However, tin plate requirements from general line can manufacturers continue to far exceed supply. There is a huge pent-up export demand. Tin plate inventories of container manufacturers are very low, although it is questionable to what extent they would be willing to augment stocks at today's prices.

Tin plate production so far this quarter has recorded little change in monthly volume from that registered in first quarter. Gradual increase in volume of electrolytic specifications is noted, which in most instances now exceeds hot-dipped tonnage.

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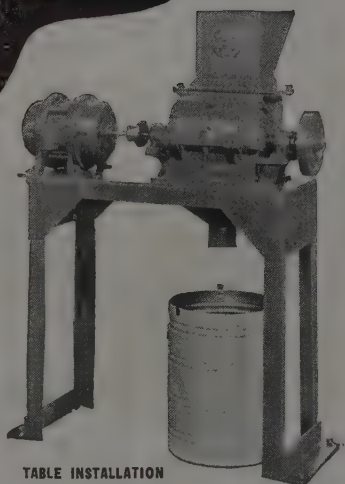


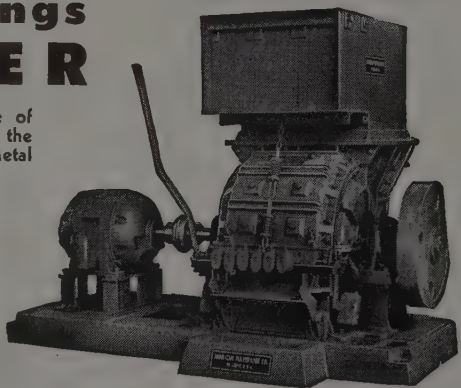
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Tubular Goods . . .

Freer supply developing in seamless tubing . . . Line pipe remains tight

Tubular Goods Prices, Page 163

Pittsburgh — Sellers of seamless and electric weld carbon steel tubing note a more conservative buying policy on part of some customers, who are carefully watching inventory position. Output of carbon steel tubing is making some headway against order backlogs, although producers are emphasizing production of more profitable alloy items. No let-up in pressure for line pipe in large size classifications is noted.

The Federal Power Commission predicts the natural gas shortage next winter will be as prolonged and severe as it was this year. The commission stated the shortage of steel pipe has created a bottleneck in gas supply, and it has been deluged with applications from natural gas pipeline companies for permission to expand existing facilities. But lack of steel for pipelines will continue to hold up construction for many months. Although Tennessee and Inch lines each plan to increase facilities more than 100 million cu ft a day next winter, unprecedented demands are outstripping the increased supply.

Boston — Except for alloys, stainless and a scattering of miscellaneous products, for which some mills and distributors are seeking volume, merchant steel pipe and most tubing specialties are sold through fourth quarter with many consumers unsatisfied, notably utilities. Unlike cast iron pipe producers, many steel pipe mills are not taking 1948 business. Nevertheless, there are some flat spots developing in tubular products, including plated tubing for furniture and baby carriages, builders of the latter turning to heavier assembly of velocipedes.

Pipe, 4-inch and over and heavier than ¼-inch wall is available for October shipment. Lack of strip impedes output by nonintegrated producers of electric-welded tubing. Industrial users normally welding bulk of needs are therefore buying more finished tubing from integrated mills. The latter, better supplied with strip, are meeting heavier demand without too much difficulty. Two mills share in heavy buying by a bicycle plant, about 1 million feet of ¾-inch and 1-inch pipe. This shortage of strip for electric welded stock does not apply to stainless, since most users, including seating and furniture shops, are well supplied with that grade. Users of some types of tubing, including copper-bearing transformer tubing, are asking also for an increase in tonnage. Some ship conversion work has been delayed by lack of steel pipe where distribution systems were damaged earlier by freezing and other unforeseen factors.

St. Louis — Pipe demand is showing a steady increase. Production schedules have been frequently upset by changing government requests to concentrate on housing or railroad cars. Pressure is especially great on sizes under two inches. No cancellations are reported but there have been fairly numerous specification changes. Schedules are filled for eight months.

Seattle — Activity in the cast iron pipe market is slow, due entirely to in-

bility of agencies to guarantee deliveries which at present are set tentatively for early 1949.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 163

Cleveland — Production of fasteners continues to be held below the industry's capacity by the shortage of carbon bars and wire rods, but mill shipments of these products in all sizes have improved slightly and some bolt interests look for still better supplies in the not far distant future. Fastener demand remains unchanged at a level far higher than supply in all of the smaller sizes and delivery promises still range upward of 6 to 8 months.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 162

Chicago—Inquiries and awards for reinforcing steel in large tonnages continue negligible in this area reflecting the extremely tight supply situation. Small jobs involving only a handful of tonnage each are in substantial volume and suppliers prefer to accommodate them than to use up their quotas from mills in the few but larger projects. The seven-day strike at the plant of Inland Steel Co. has aggravated the shortage of concrete bars for the company is an important producer of both new billet and rail steel product. The strike will result in a loss equivalent to about two weeks output.

Seattle—Bulk of new business booked

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by reinforcing bar producers consists of small jobs, involving from 20 to 50 tons each. However, the volume is heavy. Backlogs have been reduced somewhat as orders are being turned out rapidly, plants running at full capacity. Business includes miscellaneous jobs, mainly industrial and public works construction.

Warehouse . . .

Warehouse Prices, Page 165

Chicago—Although steel warehouses continue to be offered more business than they can accommodate, there is growing evidence that consumers are purchasing more cautiously. An effort is being made by manufacturers to get

a better inventory balance and it is the short items that are most sought. Distributors served by Inland Steel Co. stand to lose tonnage because of the latter's week-long strike. In some products, Inland stands to lose between two and three weeks of full production before normal output can be restored. Flat rolled products, small carbon bars and light structurals constitute the most serious shortage of warehouses.

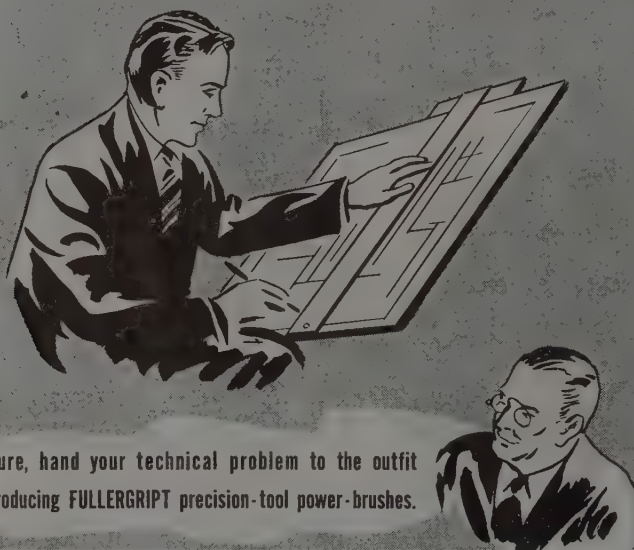
Pittsburgh — With the threat of a general steel strike out of the way, warehouse interests are hopeful that continued near capacity mill production will make it possible for producers to catch up with old orders. Some distributors have hopes of being on a current ordering basis with the mills by late third

quarter. A number of warehouses report orders still on mill books were placed as far back as last fall. Pressure for prompt shipments from warehouse stocks continues unabated, particularly for such items as light gage sheets and strip, small sized tubing, wide flanged beams, plates and carbon bars in smaller size classifications. Warehouse inventories remain at extremely low levels and unbalanced. One of the chief problems facing distributors, other than the present inadequate steel mill shipments, is that of accurately gaging future steel requirements so as not to be forced to carry a disproportionate tonnage of relatively slow moving items should the expected buyers' market develop suddenly.

Cincinnati — The ordering early this month from warehouses showed no slackening in demand for sheets, plates, bars and structurals. Mill deliveries in these most wanted items have failed to improve, hence the gap between supply and demand appears as wide as ever.

Seattle—Jobbing houses report steady demand for all items. Inventories are not gaining rapidly as shipments upon arrival as a rule are sent directly to the job. Some slight adjustments have been made in the price list to conform with revised mill prices.

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Freight Car Deliveries Increase Sharply in April

New York — Deliveries of domestic freight cars by railway car builders increased to 3489 in April, or nearly 50 per cent over March, S. M. Felton, president, American Railway Car Institute, announced last week. Deliveries from railroad shops were 634 cars, making a total of 4123 for the month. Backlog of domestic freight cars now on order and undelivered reached 102,085 as of May 1.

"During April, steel companies began rolling freight car type steel in increased volume and a further increase in rolling is scheduled for July on a 10,000-cars-a-month level," Mr. Felton said. "While these increases in metal supply cannot immediately be reflected in car deliveries, the production trend should continue to climb sharply, assuming that we get the necessary steel in full car sets."

Domestic freight car orders in April totaled 11,331, comprising 8570 which were built in commercial shops and 2751 in railroad shops. New orders this year have been at a monthly rate of 11,645 against a monthly average of 5744 in 1946. Following is a comparative table covering monthly awards of cars for domestic operation placed in both commercial and railroad shops:

	•1947	•1946	1945	1944
Jan.	9,905	1,500	7,200	1,020
Feb.	13,727	2,403	1,750	13,240
March	12,049	4,512	2,500	6,510
April	11,331	3,764	1,120	4,519
May		3,025	1,526	1,952
June		3,335	670	1,150
July		14,836	3,500	795
Aug.		9,629	7,240	3,900
Sept.		12,768	12,840	400
Oct.		3,407	1,320	2,425
Nov.		6,767	1,650	1,065
Dec.		3,041	4,116	16,245
Total		68,927	45,432	53,221

• American Railway Car Institute.

Structural Shapes . . .

Fabricators' order backlogs remain heavy despite good shipments from mills

Structural Shape Prices, Page 163

Pittsburgh — Structural steel mills in some instances report incoming orders continue to exceed production. The general decline in overall construction due to rising costs, particularly in the residential category, has not yet been reflected in volume of demand for shapes. There have been a number of instances wherein bids received on a specific project have far exceeded money appropriated for the job, notably municipal projects. This situation has forced some of this work to be temporarily shelved and has resulted in other interests holding up projected expansion programs. However, amount of steel tonnage thus affected has been relatively minor to date, with most mills reporting just as heavy order backlogs as of the first of the year. Structural fabricators have been able to make only slight headway against record order backlogs in recent months despite fact mill shipments have been relatively good.

Boston — First easing in plain structural material is expected in wide-flanged rather than standard sections as fabricator requirements are affected by declines in heavy construction. Facilities for producing standard and special sections will be taxed heavily by car building requirements and miscellaneous needs, including industrial. Only a slight easing in supply of these sections is expected until late this year. Meanwhile, order backlogs held by some smaller fabricating shops are beginning to contract, although total for the industry as a whole has held up well. Inquiry for fabricated material is lower, although Stone & Webster Engineering Corp., Boston, has a potentially large volume, including 3000 tons for a power plant in Virginia.

New York — Structural inquiry is light, with awards spotty. Leading fabricators describe the situation as increasingly dull, and see little improvement ahead until the time when builders become convinced that material and labor costs have become stabilized. It is not so much the fact that builders are waiting for lower prices as it is that they wish to be sure that there will be no reductions in costs. Among the few larger awards are a 595-ton commercial building for the Greenwich Savings Bank, West 57th St., this city.

Philadelphia — Demand for structural steel continues spotty, although volume of nonhousing construction approved by the government still far over-balances projects denied. During the period Apr. 25-May 1, inclusive, 65 projects, valued at \$1,730,843, were approved; 53, valued at \$538,804, were rejected. Most fabricating shops still have substantial order backlogs, but new contracts are spotty.

Chicago — Awards for fabricated structural steel in this district announced last week totaled over 5700 tons and involved 19 projects, making the week one of the most active in recent months. A good part of the work, however, had been bid some time ago and had just now reached the contract signing stage. There-

fore, no false conclusions should be drawn that construction activity is entering a boom. Shortage of steel and high building costs are combining to cause abandonment or postponement of numerous jobs. The seven-day strike at Inland Steel Co. worsened the plain shape supply situation in this area, and certainly forecasts cuts in customers' quotas. Even before the strike occurred there was a possibility that allocations would have to be scaled down to accommodate the freight car building program.

Seattle — Fabricators are limited by short supplies of steel and are confining business to small jobs within range of current inventories. Local plants are in doubt whether they can bid on the Narrows bridge, involving in excess of 8000

tons, bids to be asked in July by the state bridge authority, after a long delay due to the general steel shortage.

Iron Ore . . .

Iron Ore Prices, Page 164

Cleveland — A larger proportion of Lake Superior iron ore shipments from United States ranges was low phosphorus nonbessemer grade last year than in the preceding two years, according to the Lake Superior Iron Ore Association. Of last year's total shipments, 58,975,188 tons, or 74.7 per cent, were of this grade compared with 71.9 per cent, or 54,089,368 tons in 1946; 69.4 per cent, or 56,285,377 tons, in 1944.



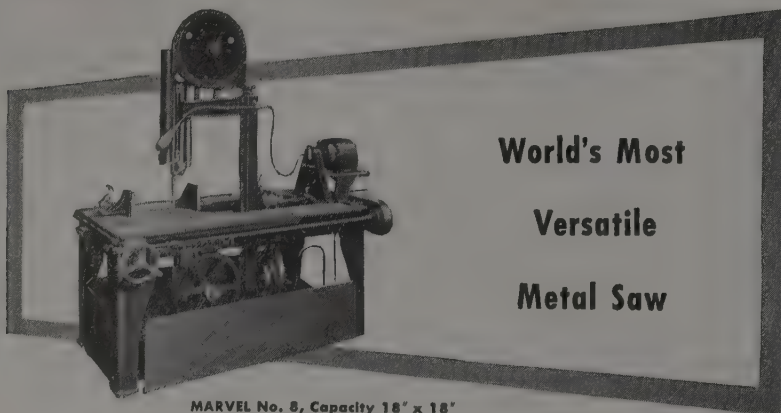
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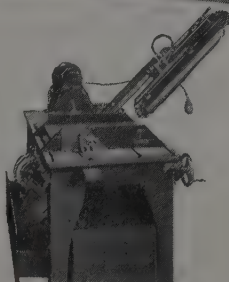
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Other grades shipped last year were high phosphorus nonbessemer, constituting 5.1 per cent, or 3,001,060 tons; manganese, 4 per cent, or 2,336,877 tons; and siliceous, 0.6 per cent, or 359,560 tons.

The average natural iron content declined from 51.72 per cent in 1944, to 51.69 per cent in 1945 and to 51.03 per cent in 1946.

Pig Iron . . .

More tonnage may be forthcoming for first quarter of next year

Pig Iron Prices, Page 164

Boston—While some large consumers and producers of castings are screening and reducing subcontracts, this has had no effect to date on melt which continues at a high level. High cost of iron castings and poor quality, in some instances, is a factor in this reshuffling of subcontracts. Rejects have been high and in machining operations carbide and other tools have suffered. Evidence gathers that the end of the most critical period in shortages of foundry iron may be approaching, despite the fact that there is no substantial tonnage increase in sight. Decline in steel scrap prices toward a more normal differential with pig iron will eventually affect the scrap-iron ration in melts while the current high level of steelworks operations precludes any improvement in supply for merchant requirements. More tonnage may be forthcoming by first quarter of next year or possibly before, which would be ahead of expectations. Some old orders for iron are being canceled out for the records; if available, this tonnage would be accepted now.

New York — Most district pig iron consumers stand to obtain a little more iron than last month. However, curtailment of by-product coke shipments due to major repairs by one eastern producer has served as a check on foundry operations which may require some time to adjust. Beehive coke producers are being called upon in increasing measure, and in some instances anthracite coal is being used to supplement fuel requirements, but producers of hand-drawn beehive coke are already well sold up to near the end of this quarter, leaving only the mechanical-drawn coke, which is not in such favor, and the hard coal to fill in any extra gaps.

Pittsburgh — Electric furnace ferro-silicon prices were reduced \$3.50 a ton May 1, to reflect reduction in price for short shoveling turnings. Price of this product has been tied to that of scrap in recent months, with the result it has fluctuated considerably. New price for electric furnace ferro-silicon, 14.01 to 14.50 per cent silicon, is \$16.75 a ton, Jackson, O., and \$67 Niagara Falls; for each additional 0.5 per cent silicon add \$1. Electro Metallurgical Sales Corp. is no longer producing electric furnace ferro-silicon at Niagara Falls, selling only from accumulated stock.

Philadelphia — Alan Wood Steel Co.,

Conshohocken, Pa., has established basic pig iron at \$35, fob Swedeland, Pa., furnace, in line with the \$4 increase which was established on other grades of iron earlier in the year. This change actually represents a drop of \$2 from the temporary price of basic it recently had in effect, and comes as a result of the decline in scrap, which has enabled it to again buy replacement scrap for its open hearths at Conshohocken at a figure which will release pig iron to the merchant trade at the lower price.

Cincinnati — Melters in this district will receive pig iron tonnage this month about equal to recent allotments, despite constant pressure for heavier shipments. There is a short lag in deliveries of southern iron. Foundry backlogs continue extended.

Chicago — Foundries are faring a little better in pig iron the past few days and every extra ton they can get permits them to lift castings output. The week-long strike at Inland Steel Co. caused five blast furnaces to be banked and, while they normally produce basic hot metal for the open hearths, it will be necessary to pig the off-grade metal made while the furnaces are being restored. In another plant, fuel oil shortage for steelmaking furnaces resulted in two blast furnaces turning over to merchant iron production until the fuel situation could be remedied. Foundries also are profiting by a somewhat better supply of cast scrap, although this grade of material is still tight.

St. Louis — Pig iron production locally remains at 500 tons daily, down 50 per cent from normal because of furnace repairs. Completion of these is expected by mid-May. Koppers United customers have been on half rations, since little outside metal is available. A recent strike-enforced reduction in operations at Granite City Steel Co., which takes hot iron from Koppers, has eased matters somewhat. Mills and foundries alike are short on pig, some reporting shutdowns near. None has ceased operations from that cause, however. Efforts of melters to obtain increased shipments from the Birmingham and Chicago districts have been largely unavailing.

Seattle—Pig iron is in short supply and demand is urgent. Furnaces have been concentrating on production of basic iron for some time but it is expected they will be back on foundry iron within two weeks and shipments will relieve the situation in this area. Shops have no inventories and are taking advantage of an improved supply of cast iron scrap, which is quoted \$27.50 for No. 1 cupola. Pig iron is unchanged at \$33.50, Provo, Utah; \$38.60 fob plant here.

Tungsten Ore . . .

New York — Tungsten ore prices, which have been highly irregular of late, have further advanced to \$27-\$28 per short ton unit, duty paid. Strength has been due primarily to small amount of tungsten imported from China since the end of the war. Much of the Chinese material has been going to Russia. Another factor has been European competition for South American tungsten, particularly that produced in Bolivia, Brazil, Peru and Argentina. Still another and highly important factor has been in-

creasing domestic demand since the end of the war for the 18-4-1 tool steels. During the war substitutions were necessary, with the 6-6-2 steels in considerable use. Contributing also to the stronger market has been absorption of considerable tungsten scrap which became available soon after the war's end.

Present high prices are again stimulating domestic production and some mines which closed soon after the war ended are reopening. It is believed some mines which closed at that time could operate at a fair profit with ore selling at around \$25, delivered in the East.

While present range of \$27-\$28 represents a good average, it does not cover the extremes. For instance, recently some distress buying brought prices as high as \$30. On the other hand, where

the pressure for delivery has not been too great, it has been possible to pick up tonnage at less than the above mentioned spread. Some tonnage was bought fairly recently in Spain, which produces both wolframite and scheelite, at lower prices.

WAA Again To Hold Sale Of Tools at Lockland, O.

Fixing of a new date for sale of surplus machine tools in the Wright Aeronautical Corp. plant at Lockland, O., is expected soon, following announcement in Washington that the War Department has released its claims on the tools.

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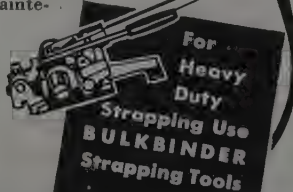
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Scrap . . .

Small lots of No. 1 heavy melting booked in Pittsburgh at \$30

Scrap Prices, Page 168

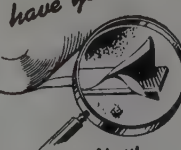
Pittsburgh — Except for one large interest which has bought only relatively small lots recently, mills in this district continue out of the market. This interest formerly held up shipments on old orders within price range of \$37 to \$38 for heavy melting steel, but recently has released shipments on this basis. Considerable tonnage still is outstanding on \$32.50 orders. However, this interest has refused offer from the railroads for heavy melting at \$34.50, and continues to place small tonnage orders at the \$30 level. Despite fact most of mills here continue out of the market, scrap prices appear to be stabilizing at around \$30.

Sales of No. 1 railroad heavy melting steel by railroads in price range of \$34 to \$34.50 were made last week. Rails in random lengths were sold at around \$35 to \$36; angles and splice bars, \$37 to \$38; and railroad specialties at \$41 to \$41.50. Until award of the Pennsylvania Railroad list is made, prices for other railroad scrap items must remain largely nominal.

Cast iron scrap prices are very strong, although many foundries continue out of the market. Offers to buy No. 1 cupola at \$39 have been turned down by dealers here. Some weakness is noted in prices for turnings with at least one sale of machine shop reported at \$26; price for short shoveling turnings is within range of \$28 to \$29. Leading consumers report heavy receipt of scrap under old orders and on a reciprocity basis from customers. Some interests state they can hold off placing new orders for six to eight weeks. One major question facing steel producers is prospect of a nationwide coal strike, which would almost immediately force curtailment in steel-making operations.

New York — Although scrap brokers' buying prices are leveling off here, there has been a further modest reduction in some grades. No. 1 and No. 2 heavy melting steel grades have been reduced to \$24 to \$25, fob shipping point. No. 3 bundles are now \$23; machine shop turnings and mixed borings and turnings, \$17.50; short shovel turnings, \$18.50. All other grades are unchanged. Scrap collections are falling off because of the substantially lower prices which have developed over recent weeks and while consuming demand is more active, following expiration of various contracts at the end of April, few large tonnages have been reported placed at even present levels.

Philadelphia — Scrap prices in eastern Pennsylvania declined again last week, with contracting for heavy melting steel since the first of the month involving generally moderate tonnages. There are indications of a leveling off in prices, but consumers nevertheless are still moving somewhat cautiously. Reductions have not only applied to virtually all grades of steel scrap, but to cast grades as well. Only in malleable has there been no further change. Malleable has been holding steady at \$48 to

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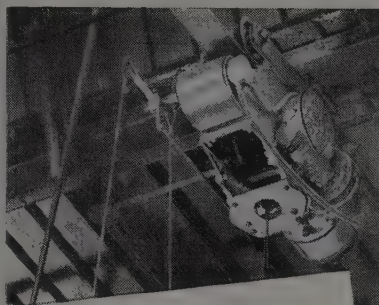
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\$49, delivered, for the past few weeks due to scarce supplies.

No. 1 heavy melting steel is quoted \$29 to \$30, delivered, with the inside figure the more representative; No. 2 heavy melting, \$27.50 to \$28; No. 1 busheling, \$27.50 to \$28; No. 1 bundles, \$29 to \$30; No. 2 bundles \$25.50 to \$26; No. 3 bundles, \$23.50 to \$24.

Machine shop turnings have declined to \$22.50 to \$23; mixed borings and turnings, \$20.50 to \$21; short shovel turnings, \$23.50 to \$24. Bar crops and plate, punchings and plate scrap, and cut structurals are now \$31 to \$32; electric furnace bundles, \$30 to \$31; heavy turnings, \$29.50 to \$30; chemical borings, \$29 to \$30.

No. 1 cupola cast has been reduced to \$40 to \$42, with one large consumer having bought a modest tonnage at the inside figure. Charging box cast is \$38 to \$39; unstripped motor blocks, \$36.50 to \$37; clean auto cast, \$40 to \$42; No. 1 wheels, \$42 to \$43.

Buffalo — Indications that the scrap market may tend to level off at recently-slashed prices appeared last week as fresh buying was reported with no further cuts. In fact, steadier tendencies were noted as a definite price separation took place between No. 1 and No. 2 grades of heavy melting. Sales of No. 1 material were reported at \$31 to \$33 a ton while No. 2 continued to change hands at the prevailing range of \$29 to \$31. Additional buying inquiries at \$1 below the range for No. 2 heavy melting scrap were turned down by dealers. The price split developed when mills working on high grade products demanded a better grade of scrap. A considerable volume of No. 2 material and bundles has been rejected in recent weeks. With supplies increasing and the market no longer a decided seller's affair, more precaution is taken in the preparation of bundles. An increased supply of cast scrap is also reported with some confusion and uncertainty over prices, but the quoted range for No. 1 cupola remains \$37 to \$40.

Cleveland — Downtrend in scrap prices was checked last week and a slightly firmer undertone developed. Real test of the market will not be made, it is believed in the trade here, until May 15. One of the major steel mills here entered the market for the first time in weeks, confirming the previously quoted nominal price of \$30.50 to \$31 for No. 1 heavy melting steel scrap. Based on May lists, railroad scrap was quoted \$32 to \$35 for No. 1 heavy melting, the lower range representing tonnages earmarked for open hearths and the higher range representing sales to foundries; malleable, \$52 to \$55; rails, 3 feet and under, \$44; angles and splice bars, \$44.

Foundries have been able to build up a reserve equivalent to about 30 days' needs, compared with a low of less than a week's supply earlier in the year. Shipments have increased and grading has improved, following the recent wave of rejections of material not meeting specifications. Low phos is quoted \$33.50 to \$34.50. Burnt cast is slightly lower at \$38.

Detroit — Prices on steel grades here have sagged another \$5 per ton to \$24.50-\$25 and tonnage is moving at these figures. Turnings are off \$2; plate scrap, off \$3; cast iron grades, off \$3. There was considerable scrambling among dealers to fill old April orders, carrying a

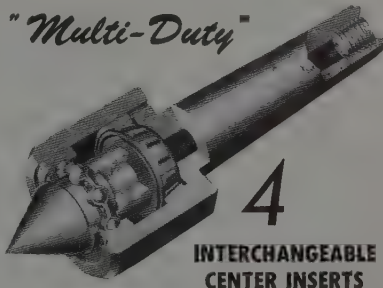


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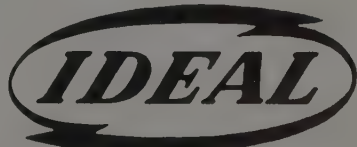
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higher price, resulting in a fairly good clearing of stocks, but ample supplies are coming in at the moment, and there is some feeling prices may drift a little lower this summer. However, it must be kept in mind steel mills maintain high operating rates which call for a steady flow of scrap, tending to offset price weakness. Virtually all automobile production scrap still is being channeled to specific mills, a practice which it had been hoped a freer market would discourage.

Chicago — During last week, scrap prices settled another \$3 per ton, in drops of \$1.50 each. Open-hearth material is now available at \$28.50 a ton, delivered mill. For the first time since end of the war, a buyers' market prevails, for at present there is virtually no buying and the quotations represent brokers' offering prices. All steelmakers appear to have sizable inventories which were accumulated at the higher prices previously prevailing. Lack of buying plus a better supply have been major factors in softening the market. For some time a \$30 market had been freely predicted and now that the market has dropped below that level it is anybody's guess as to which way the market will turn. Because of its strike, Inland Steel Co. stopped taking shipments on May 2 but presumably will resume acceptance at once now that operations are resuming. Machine shop turnings and mixed borings and turnings are quoted \$22.50 to \$23.50; short shovel turnings, \$24.50 to \$25.50; bar crops and plate, \$30.50 to \$31.

St. Louis — Scrap prices continue to ease here, some items dropping 5 to 10 per cent, a few remaining temporarily firm. No. 1 heavy melting steel is quoted \$29 to \$30, down \$2.50 from two weeks ago, while No. 1 cast iron wheels remain at \$34 to \$36.

Railroads are getting slightly increased new steel supplies, but their scrap marketings have not yet shown a resulting hike. Mills are expected to resume buying the week of May 12, following a three-week withdrawal from the market. Reserves are now above the 30-day mark. The outlook for broker shipments from remote points is uncertain. They were heavy two weeks ago, as shippers moved long-accumulated tonnage to meet the April-end deadline. Weather has been a favorable factor, and efforts to get in ahead of a further price drop may prove another. Swift price fluctuations are producing more uncertainty in the scrap market here than at any time after de-control.

Seattle—The steel scrap situation has improved materially, with increased shipments arriving from normal sources and a larger volume being released by ship breaking plants. While the delivered price for No. 1 heavy melting remains \$29 a ton, the market has weakened slightly due to larger receipts. Mills have reduced prices at remote points from \$19 to \$16.50. Stove plate scrap is quoted \$23, delivered plant.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, state bascule bridge over Passaic river in northern New Jersey, to Mt. Vernon Bridge Co., Mt. Vernon, O.
1100 tons power plant, Pacific Gas & Electric Co., Hunters Point, Calif., to Bethlehem Steel Co., Bethlehem, Pa.; Stone & Webster Engineering Corp., Boston, engineer-contractor.
875 tons, chemistry and chemical engineering

building, University of Illinois, Urbana, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

740 tons, addition to Bayside station, Green Bay, Wis., to Milwaukee Bridge Co., Milwaukee.

595 tons, Greenwich Savings Bank building, West 57th St., New York, through Edward Corning Co., that city, to Bethlehem Fabricators Inc., Bethlehem, Pa.

565 tons, transmission towers, Illinois Power Co., Wood River, Ill., to Blaw-Knox Co., Pittsburgh.

525 tons, mill building, Hudson Worcester Co., Hudson, Mass., to Bethlehem Fabricators Inc., Bethlehem, Pa., through Tredennick-Billings Co., Boston, general contractor.

520 tons, mill building, Korumel, Heffron & Preiss Steel Co., Evanston, Ill., to Wend-nagel & Co., Chicago.

450 tons, enameling shop, John A. Roebling's Sons Co., Trenton, N. J., to Belmont Iron Works, Eddystone, N. J., previously noted as an unnamed fabricator.

450 tons, bridge 5718, Kettle river, Minn., for state, to American Bridge Co., Pittsburgh.

405 tons, railroad grade separation W2VF, Fayette county, Ill., for State Highway Division, to Illinois Steel Bridge Co., Jacksonville, Ill.

275 tons, warehouse extension, Electro-Motive Division, General Motors Corp., LaGrange, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

350 tons, Medical Center, Boston, through Barr & Lane, New York, to Bethlehem Steel Co., Bethlehem, Pa.

320 tons, color type building, Clifton, N. J., through Mahoney Troast Co., Passaic, N. J., to the Oltmer Iron Works, Jersey City, N. J.

300 tons, technical laboratory, Stevens Institute of Technology, Hoboken, N. J., through Walter Kidde & Co., New York, to Schacht Steel Construction Inc., New York.

300 tons, bridge 2 of 7-4-5, CI, Alberta, Mich., to American Bridge Co., Pittsburgh.

275 tons, diesel engine repair shop, Pennsylvania railroad, Enola, Pa., to Belmont Iron Works, Eddystone, N. J.

240 tons, North River Savings Bank building, New York, through Irons & Reynolds, that city, to Schacht Steel Construction Inc., New York.

220 tons, warehouse, American Tobacco Co., Lexington, Ky., through Francisco & Jacobus, New York, to Deleson Steel Co., a northern New Jersey concern.

200 tons, addition, St. Joseph's hospital, Mishawaka, Ind., to Mississippi Valley Structural Steel Co., Decatur, Ill.; Peter Schumacher Sons, Mishawaka, Ind., contractor.

196 tons, beam spans, projects F 019-2(7) and F 04-4(11), Wood county, Wis., for State Highway Commission, to Worden-Allen Co., Milwaukee.

196 tons, beam spans, Proj. S 075(3), Dunn county, Wis., for State Highway Commission, to Worden-Allen Co., Milwaukee.

185 tons, bridge, Sec. 3F, Marshall county, Ill., for State Highway Division, to Illinois Steel Bridge Co., Jacksonville, Ill.

173 tons, beam spans, Projects 0187(2) and T 0203(2), Grant county, Wis., for State Highway Commission, to Milwaukee Bridge Co., Milwaukee.

172 tons, Fish creek bridge, Proj. WER 1, Bayfield county, Wis., for State Highway Commission, to Milwaukee Bridge Co., Milwaukee.

160 tons, factory building, Burton Auto Spring Corp., Chicago, to Duffin Iron Co., Chicago.

139 tons, beam spans, Proj. T 024-1(1), Vilas county, Wis., for State Highway Commission, to Worden-Allen Co., Milwaukee.

120 tons, bridge, Sec. 43F, Pike county, Ill., for State Highway Division, to Illinois Steel Bridge Co., Jacksonville, Ill.

100 tons, factory addition, Anaconda Wire & Cable Co., Marion, Ind., to Mississippi Valley Structural Steel Co., Decatur, Ill.; Rowman Construction Co., Marion, Ind., contractor.

100 tons, Abbott power plant, University of Illinois; Urbana, Ill., to Duffin Iron Co.,

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STRUCTURAL STEEL PENDING

- 8000 tons or more, Narrows bridge; bids to State Bridge Authority, Olympia, Wash., after July 1.
- 3000 tons, power plant in Virginia; Stone & Webster Engineering Corp., Boston, engineer-contractor.
- 2200 tons, sheet piling, power house, Illinois Power Co., Wood River, Ill.; bids in.
- 1500 tons, Northport state bridge; bids soon to highway director, Olympia, Wash.
- 1500 tons, War Memorial building, American Legion, Indianapolis; bids May 16.
- 1500 tons, building, Evinrude Motors Division, Outboard Marine Mfg. Co., Milwaukee; bids Apr. 30.
- 850 tons, superstructure, Hampton Harbor, N. H.; bridge; Phoenix Bridge Co., Phoenixville, Pa., low.
- 800 tons, power plant expansion, Central Illinois Electric & Gas Co., Rockford, Ill.; Stone & Webster Engineering Corp., Boston, engineer.
- 800 tons, Lady of Lourdes hospital, Camden, N. J.; bids asked.
- 650 tons, beam spans, Splendore, Tex., for State Highway Department.
- 500 tons plus, eight Columbia river crossing towers for Bonneville Administration; Tower Sales & Erecting Co., Portland, low \$306,781.
- 500 tons, truck warehouse, General Motors Co., Philadelphia, pending.
- 500 tons, bascule bridge, Corson Inlet, Strathmere, N. J., for Cape May county commission; Howard, Needles, Tammen & Bergendorf, New York, engineers; bids May 26. 150 tons of reinforcing steel for repairs to another bridge for the commission also are up for figures May 26.
- 400 tons, Pulaski grade school, Board of Education, Chicago; Reuter Bros. Iron Works Inc.,

Chicago, low; bids May 2.

- 375 tons, addition to foundry, American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill.; Ragnar Benson Inc., Chicago, contractor; bids May 23.
- 260 tons, including bars, Cowlitz county state bridge, Washington; bids to Olympia, May 20.
- 220 tons, beam spans, Proj. F 028-4(14), Douglas county, Wis., for State Highway Commission; bids of Apr. 8 rejected.
- 215 tons, addition, Public School No. 105, Bronx, New York, bids closed May 7.
- 215 tons, bridge, International Harvester Co., Milwaukee.
- 203 tons, highway bridge FI-142(17), Winnebago county, Ill., for State Highway Division; Duffin Iron Co., Chicago, low; bids May 2.
- 164 tons, bridge, Sec. 136F2, Alexander county, Ill., for State Highway Division; Duffin Iron Co., Chicago, low; bids May 2.
- 100 tons, crossing towers, The Dalles, Oreg., for Bonneville Administration; Gunderson Bros., Portland, low \$35,500.
- Unstated, \$1,250,000 steel bridge, Clearwater river, Lewiston, Idaho; bids to Boise, May 23; James Reid, highway director.

REINFORCING BARS . . .

REINFORCING BARS PLACED

- 160 tons, sanitarium at Spokane, Wash., to Bethlehem Pacific Coast Steel Co., Seattle.
- 120 tons, power plant, Consolidated Badger Co-operative, Appleton, Wis., to Joseph T. Ryerson & Son Inc., Chicago; E. H. Meyer Construction Co., Oshkosh, Wis., contractor.
- 105 tons, conveyor manufacturing building, Goodman Mfg. Co., Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; Sumner S. Sollitt & Co., Chicago, contractor.

REINFORCING BARS PENDING

- 325 tons, reinforced concrete highway sections, Wallingford and Danbury, Conn.; bids May

12, Hartford; latter project also includes three-span I-beam bridge.

- 300 tons, power house and tunnel, Southern Illinois University, Carbondale, Ill.; bids May 13.
- 300 tons, power plant extension, Central Illinois Electric & Gas Co., Rockford, Ill.; Stone & Webster Engineering Corp., Boston, engineer; bids May 5.
- Unstated, four state bridges, Milton, Oreg.; general contract to E. C. Hall Co., Portland.
- Unstated, five state bridges in Klamath, Yamhill and Tillamook counties, Oregon; bids to Portland, May 15.
- Unstated, 1800-foot tunnel, state hospital, Salem, Oreg.; Viesko & Post, Portland, low, \$158,539.
- Unstated, 300-bed state hospital, Salem, Oreg.; L. H. Hoffman, Portland, low, \$1,516,022.
- Unstated, nurses school, Providence hospital, Portland; Ross B. Hammond Co., Portland, low, \$875,000.

PLATES . . .

PLATES PLACED

- 2200 tons, dry holder, New Haven, Conn., utility company, let through United Engineers & Constructors Inc., Philadelphia, to Bartlett & Hayward, Baltimore.
- 500 tons plus, 23,143 feet, 58 $\frac{1}{8}$ -inch steel water pipe for Tacoma, Wash., to American Pipe & Construction Co., Portland, low \$591,676.

PLATES PENDING

- Unstated, three steel penstocks, 8 $\frac{1}{2}$ -foot diameter, for Mud Mountain dam, Washington state; General Construction Co., Seattle, low, \$264,955.
- Unstated, 10,000-barrel storage tank, Tacoma, Wash.; funds appropriated.

PIPE . . .

STEEL PIPE PLACED

- 205 tons, 96-inch pipe, Madras, Oreg., for U. S. Bureau of Reclamation, to Pacific Coast Engineering Co., Alameda, Calif.; bids Apr. 18.

STEEL PIPE PENDING

- Unstated, 19,000 feet, 16 and 8-inch pipe for Bow Lake airport water system, Port of Seattle; Stateside Construction Co., Seattle, low \$177,000.

CAST IRON PIPE PENDING

- 1000 tons, Portland, Oreg.; bids in.

RAILS, CARS . . .

LOCOMOTIVES PLACED

- Minneapolis, St. Paul & Sault Ste. Marie, eight 1500-horsepower diesel switch engines, to Baldwin Locomotive Works, Eddystone, Pa.
- Union Pacific, seven diesel locomotives, with three 2000-horsepower passenger locomotives going to Fairbanks, Morse & Co., Chicago; three 400-horsepower diesel switch engines to General Electric Co., Schenectady, N. Y.; and one 1500-horsepower freight locomotive to American Locomotive Co., New York.

RAILROAD CARS PLACED

- Atchison, Topeka & Santa Fe, 225 seventy-ton hoppers, to Pressed Steel Car Mfg. Corp., Chicago.
- Denver & Rio Grande Western, 10 cabooses, to own shops.
- Pittsburgh & Shawmut, 200 fifty-ton steel hopper cars, to Pressed Steel Car Co., Pittsburgh.
- Virginian railroad, 1000 fifty-five-ton hopper cars, to own shops at Princetown, W. Va.

RAILROAD CARS PENDING

- Chicago, Milwaukee, St. Paul & Pacific, 1000 fifty-ton hopper cars, 250 seventy-ton hopper cars, and 250 fifty-ton gondola cars, bids asked.
- New York City Board of Transportation, 150 subway cars for the Interboro lines, bids closed May 12.

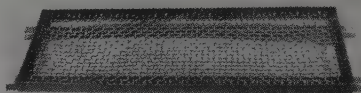
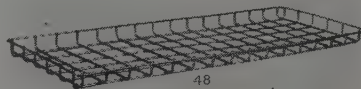
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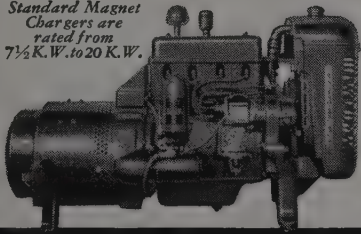


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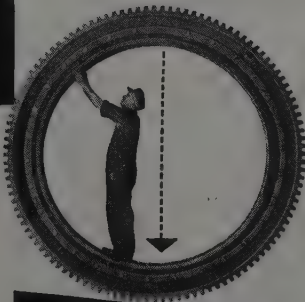
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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Minnesota Mining & Mfg. Co., 631 S. Anderson St., will build a 1-story, 100 x 200 ft factory for manufacture of rubber cement and a 1-story, 50 x 100 ft mixing room. Cost will be \$345,000.

SAN GABRIEL, CALIF.—Clary Multiplier Co., 1524 N. Main St., Los Angeles, has awarded a \$200,000 contract to Ryan A. Gru, 2012 Rockford Rd., Los Angeles, for a factory here. Architect is A. Froelich, 367 S. Robertson Blvd., Beverly Hills.

CONNECTICUT

BRIDGEPORT, CONN.—Bridgeport Brass Co., 30 Grand St., has awarded a \$142,000 contract to Stone & Webster Corp., 49 Federal St., Boston, for a 1-story boiler plant.

STAMFORD, CONN.—American Cyanamid Co., 1837 W. Main St., is asking for bids on a proposed factory.

WEST HARTFORD, CONN.—Bush Mfg. Co., 179 South St., has awarded a \$125,000 contract to F. H. McGraw Co., 780 Windsor St., Hartford, for factory alterations and extensive power installations.

FLORIDA

JAY, FLA.—Escambia River Electric Co-operative Inc. has REA loan of \$500,000 for system improvements and 309 miles of line.

PANAMA CITY, FLA.—Gulf Coast Electric Co-operative Inc. has REA funds of \$165,000 for system improvements and 90 miles of line.

MIAMI, FLA.—Florida Power & Light Co. has let a \$380,000 contract to Powell Bros. Inc., P. O. Box 281, Fort Lauderdale, for work in connection with 40,000 kw extension of the Miami steam electric station.

GEORGIA

DALTON, GA.—North Georgia Electric Membership Corp. has REA funds of \$350,000 for system improvements and 202 miles of line.

DOUGLASVILLE, GA.—Douglas County Electric Membership Corp. has REA funds of \$130,000 for 86 miles of line.

SAVANNAH, GA.—U. S. Engineer has received a low bid of \$77,601 from Savannah Machine & Foundry Co., P. O. Box 590, for drydocking and repairing the U. S. pipe line dredge, *Henry Bacon*.

IDAHO

KELLOGG, IDAHO—Continental Mining Co. has announced plans for construction of 500-ton sink and float plant.

ILLINOIS

WAUKEGAN, ILL.—American Steel & Wire Co., 208 S. LaSalle St., Chicago, has awarded a \$1 million contract to Ray Borregard for 1-story plant additions.

INDIANA

MARION, IND.—Anaconda Wire & Cable Co., E. A. Ranfer, manager, proposes to build a 1-story, 120 x 140 ft factory addition costing \$120,000.

MARION, IND.—Wiley & Lett Division, Lynch Corp., T. C. Werbe, president, 2304 Crystal St., Anderson, has awarded a \$164,000 contract to Lathrop & Sons Inc., 1510 Montcalm St., Toledo, O., for a 1-story factory.

IOWA

WATERLOO, IA.—John Deere Tractor Co., Niles Rd., has awarded a \$740,000 contract for a 6-story gear manufacturing plant to Jens Olesen Sons Construction Co., 321 W. 18th St.

LOUISIANA

NEW ORLEANS—U. S. Engineer has received a low bid of \$60,133 from Forcum-James Co., P. O. Box 911, for fabrication and installation of steel sector gates in partially completed

flood-gate structure at Chartenton Beach, St. Mary Parish.

MASSACHUSETTS

MANSFIELD, MASS.—National Gypsum Co. Inc., 87 Central St., has awarded a \$55,000 contract for a 1-story, 90 x 160 ft factory to Walter H. Barker Inc., 23 Main St., Taunton.

MICHIGAN

BELLELEVILLE, MICH.—J. & L. Tool & Mfg. Co., 45132 Van Born Rd., has been formed by John C. Lasko with a capital of \$100,000 to manufacture tools of all kinds.

DETROIT—Parker Rust Proof Co. is taking figures for construction of a \$175,000 building addition at Morenci.

DETROIT—Becker Mfg. Co., 1621 National Bank Bldg., has been formed by Robert J. Menzies with a capital of \$100,000 as a stamping and machine shop business.

DETROIT—Bordeaux Pattern & Mfg. Co., 19636 Derby St., has been formed by Hector J. Bordeaux with a capital of \$50,000 as a pattern and model making business.

DETROIT—Plymouth Permanent Casting Co., 2048 Elmhurst St., has been formed by Anthony Nyeste with a capital of \$50,000 to manufacture foundry castings.

DETROIT—Molded Products Co., 9316 French Rd., has been formed by David E. Clemenson with a capital of \$50,000 to manufacture plastic molds and dies.

DETROIT—Wiregraph Corp., 415 Brainard Rd., has been formed by Harlan R. Bird with a capital of \$50,000 to manufacture and sell electrical equipment.

JACKSON, MICH.—P & S Mfg. Co. Inc., 444 E. South St., has been formed by Frank R. Smith with a capital of \$50,000 to manufacture and sell metal, wood and plastic products.

ST. JOHNS, MICH.—Sealed Power Corp., Muskegon, has received CPA approval for a \$301,000 factory.

MISSISSIPPI

BATESVILLE, MISS.—Tallahatchie Valley Electric Power Association has REA loan for \$565,000 for system improvements, warehouse facilities and 324 miles of line.

CLARKSDALE, MISS.—Coahoma Electric Power Association has REA funds of \$315,000 for system improvements, purchase and installation of a two-way radio system and 79 miles of line.

NATCHEZ, MISS.—Interstate Oil Pipeline Co., P. O. Box 1349, Tulsa, Okla., has awarded a \$185,000 contract to Associated Contractors and Engineers, c/o owner, for 10 miles of crude oil pipelines between Natchez and Sibley, Miss.

NEW JERSEY

PARLIN, N. J.—E. I. duPont de Nemours Co. has awarded a \$65,000 contract for a 2-story plant addition to Wigton-Abbott Corp., 1225 South Ave., Plainfield.

NEW YORK

JAMESTOWN, N. Y.—Jamestown Metal Equipment Co. will begin construction of a \$200,000 plant addition to be used for manufacture of automotive heaters and regulators. Structure will have 50,000 sq ft of floor space.

NEW YORK—Fisher Bros. Steel Corp., 207 Morris Ave., plans to build a \$145,000 office and warehouse on Webster Ave., near Claremont Pky.

NORTH CAROLINA

CHARLOTTE, N. C.—Edgecomb Steel Co., Philadelphia, has purchased a five-acre site on Atlando Ave. for a proposed steel warehouse. To cost \$500,000, the facility will be 1-story.

RALEIGH, N. C.—Bureau of Community Fa-

cilities plans a \$76,000 project to extend the city's water system and a \$54,000 project to extend the sewer system.

OHIO

CLEVELAND—Allene-Ryan Foundry, Aetna Rd. at E. 91st St., has awarded a \$69,000 contract to John G. Weide, 18944 Winslow Rd.; Shaker Hts., for a foundry addition.

CLEVELAND—U. S. Steel Supply Co., 1804 E. 99th St., has awarded a \$211,000 contract to Darin & Armstrong, Stumpf Rd., for a 1-story office building at 7100 Bessemer Rd.

LORAIN, O.—Lake Terminal Railroad, which operates within the National Tube Co., has announced a modernization program which includes construction of a new roundhouse. Project, including equipment, will cost \$300,000.

WARREN, O.—American Welding & Mfg. Co. plans to purchase machinery and equipment for its plant here which it purchased from the government recently.

PENNSYLVANIA

ALTIQUIPPA, PA.—Jones & Laughlin Steel Corp., 3rd and Ross Sts., Pittsburgh, plans to spend \$541,000 in improvements which include a spring wire manufacturing building, and machine shop alterations; two mill buildings and a 1-story extension to its engine room. Steel for first and last three projects awarded to Fort Pitt Bridge Works, Keystone Hotel, Pittsburgh.

NEVILLE ISLAND, PA.—Watson-Standard Co., Pittsburgh, will build a plant here for production of plastic finishes.

RHODE ISLAND

PROVIDENCE, R. I.—Lew Mfg. Co., 217 Huntington Ave., will build 2-story, 45 x 90 ft and 65 x 80 ft factory additions. Cost will be \$70,000.

SOUTH CAROLINA

BAMBERG, S. C.—Edisto Electric Co-operative Inc. has REA funds of \$250,000 for system improvements and 165 miles of line.

MATTHEWS, S. C.—Tri-County Electric Co-operative Inc. has REA loan for system improvements and 146 miles of line.

WISCONSIN

MILWAUKEE, WIS.—Gleason Steel Corp. will build a \$40,000 warehouse at 529 E. Erie St. The 1-story building, 158 x 50 ft, will contain 7810 sq ft of floor space.

WYOMING

CHEYENNE, WYO.—Frontier Refining Co., 123 Duff Ave., plans to make improvements totaling \$500,000 at its gasoline plant.

CANADA

CALGARY, ALTA.—John Deere Plow Co. Ltd., 205 10th Ave. E., has awarded a \$60,000 contract to Larwill Construction Co. Ltd., 111 3rd St. W., for a storage shed building.

CALGARY, ALTA.—Western Gypsum Co., Ltd. has awarded a \$200,000 contract to Bennett & White Calgary Ltd. for a gypsum plant.

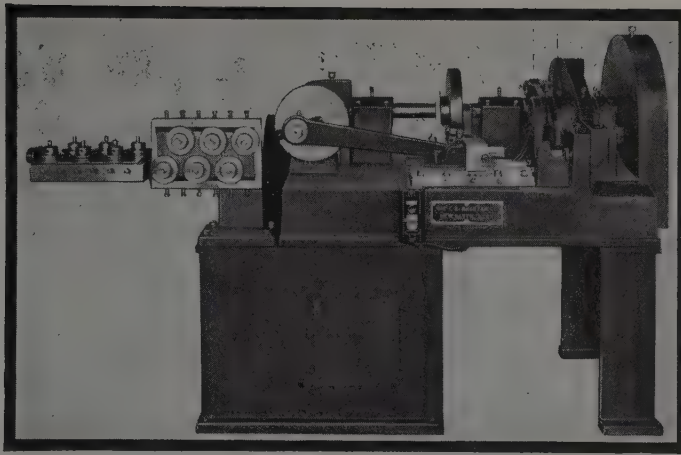
SHERRIDON, MAN.—Sherritt Gordon Mines Ltd., 25 W. King St., Toronto, Ont., plans to build a \$500,000 hydro-electric power plant near here.

FORT ERIE, ONT.—Horton Steel Works Ltd., 40 Jennet St., has awarded an \$85,000 contract to Frid Construction Co. Ltd., 128 King St. E., Hamilton, Ont., for plant units.

HAILEYBURY, ONT.—Faustin Explorations Ltd., c/o C. F. Tuer, K. C., plans to spend \$150,000 on a mining development here.

LONDON, ONT.—Kelvinator of Canada Ltd., C. W. Haddon, general manager, Dundas St., has awarded a \$250,000 contract to Hyatt Bros., 290 Egerton St., for a 1-story plant.

TORONTO, ONT.—Metal Stampings Ltd., Danforth Ave., has awarded a \$138,513 contract for a rolling mill and office.



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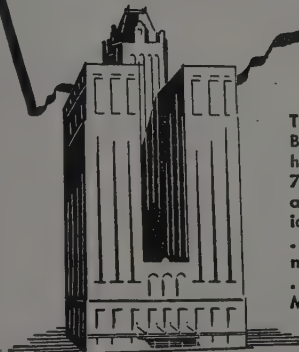
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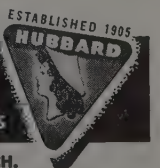
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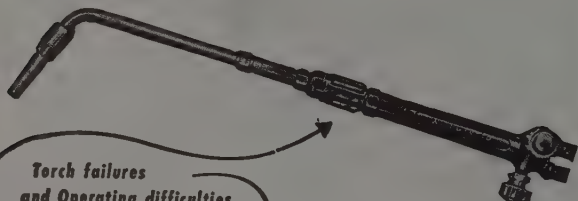
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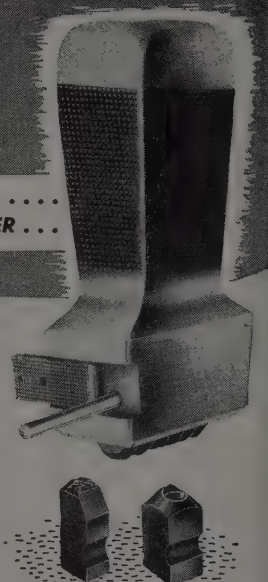
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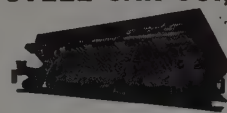
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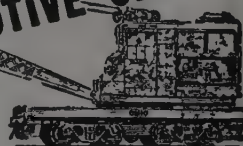
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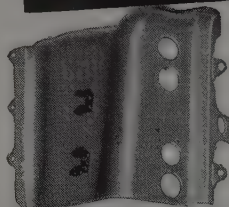
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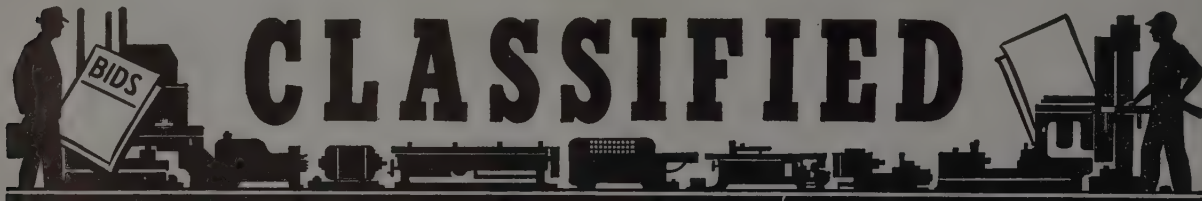
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ing complete details of experience, places
of employment, education, any special
qualifications, and salary expected. Your
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IN MIDDLE WEST**

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Metal Specialties comprised of **STAMPINGS, FORMING, WELDING, SPINNING, MACHINING.** All Metal or Combined with Non-Metal Materials

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321 Dixie Terminal

Cincinnati 2, Ohio

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Money saved on repairs soon pays for Farval

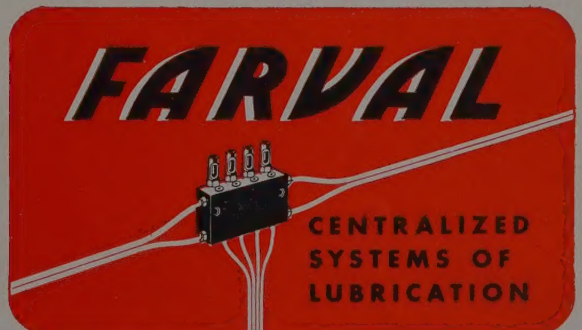
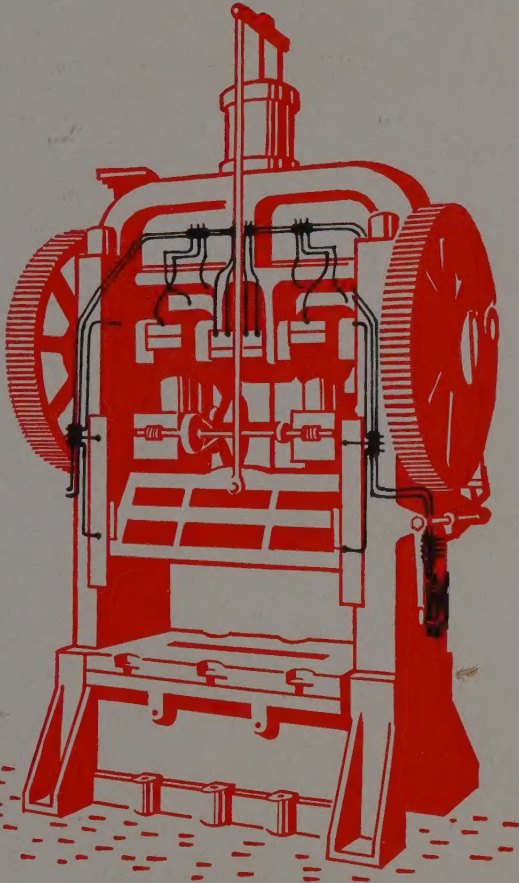
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Then a Farval Centralized Lubricating System was installed. Proper lubrication brought an immediate, noticeable improvement. At the end of a full year's operation, not one cent had been spent on maintenance and not one minute of production time had been lost due to faulty lubrication. Farval had soon paid for itself.

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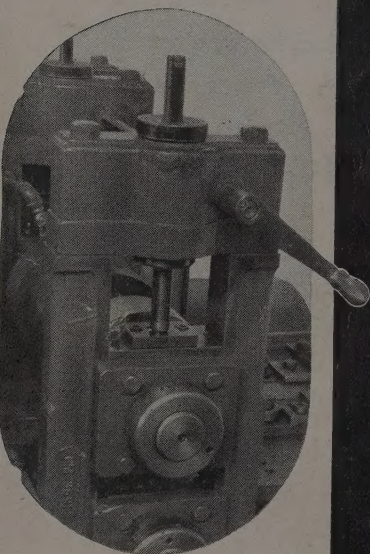
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Centralized Lubrication
No. 93**



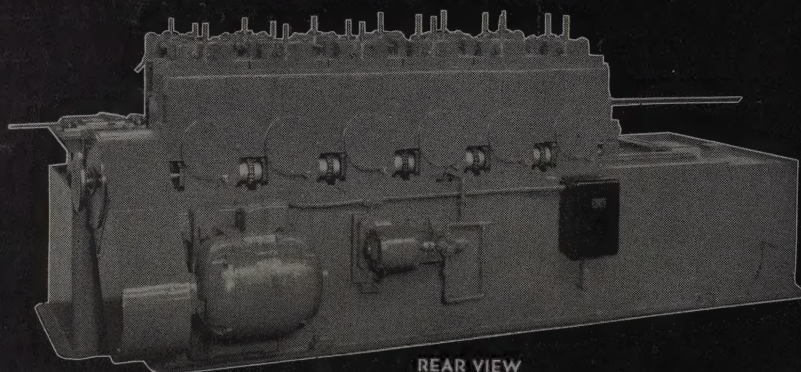
McKAY

ROLL FORMING
MACHINES FOR
PRODUCING SHAPES FROM FLAT STEEL

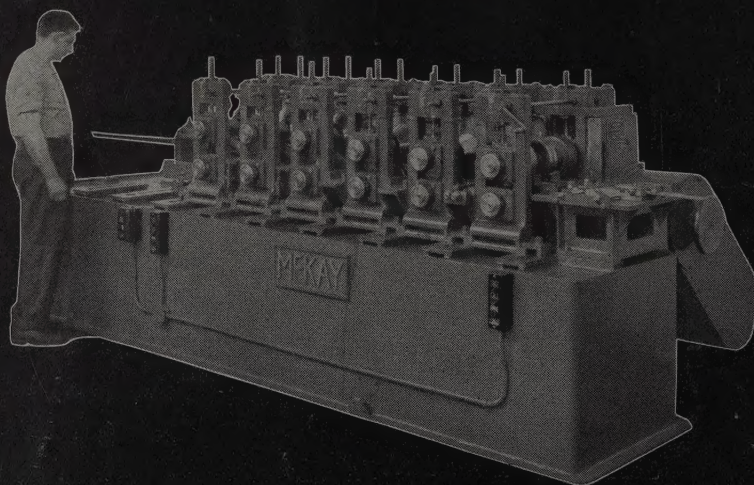
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to Make Every Section



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MICROMETER
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AND MANUFACTURERS OF
TUBE MILLS

USING

ELECTRIC RESISTANCE WELD
OXY-ACETYLENE WELD
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